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Canada. Royal commission on coal.

Minutes. V. 1-4, 1945.

1946



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CANADA

ROYAL COMM. ON COAL

MINUTES

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6.8.46







Sydney, N. S., Tuesday, January 16th, 1945, 10:00 A.M.

PRESENT: Honorable Mr. Justice W. F. Carroll, Chairman.

Angus J. Morrison, Esquire, Member.

Honorable Mr. Justice C. C. McLaurin, Member.

J. J. Frawley, K.C., Counsel for Commission.

Robert D. Howland, Secretary.

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The Chairman then read the appointment of the Commission

as follows:

(Sgd) ATHLONE

C A N A D A

GEORGE THE SIXTH, by the Grace of God, of Great Britain, Ireland and the British Dominions beyond the Seas KING, Defender of the Faith, Emperor of India;

TO ALL TO WHOM these Presents shall come or whom the same may in any way concern,

GREETING;

WHEREAS pursuant to the provisions of Part I of the Inquiries Act, Revised Statutes of Canada (Sgd) F. P. Varcoe 1927, Chapter 99, His Excellency the Governor General in Council, by Order P. C. 7756, of the twelfth day of October in the year of Our Lord one thousand nine hundred and forty-four, copy of which is hereto annexed, has authorized the appointment of Our Commissioners therein and hereinafter named to inquire into and report upon the problems of and matters pertaining to the coal industry in Canada, having regard, generally, to pre-war, present and anticipated post war conditions and the probable future development of Canada.

NOW KNOW YE that by and with the advice of our Privy Council for Canada, We do by these Presents nominate, constitute and appoint the HONOURABLE MR. JUSTICE W. F. CARROLL, of the City of Halifax, in the Province of Nova Scotia; ANGUS J. MORRISON, Esquire, of the City of Calgary, in the Province of Alberta, and the HONOURABLE MR. JUSTICE C. C. McLAURIN, of the City of Calgary, in the Province of Alberta, to be Our Commissioners to conduct such inquiry.







TO HAVE, HOLD, exercise and enjoy the said office, place and trust unto the said W. F. CARROLL, ANGUS J. MORRISON and C. C. McLAURIN together with the rights, powers, privileges and emoluments unto the said office, place and trust, of right and by law appertaining, during Our pleasure.

AND WE DO HEREBY authorize Our said Commissioners to have, exercise and enjoy all the powers conferred upon them by the Inquiries Act, Part I, including the powers and authorities mentioned and described in the Eleventh Section of the said Act.

AND WE DO HEREBY require and direct Our said Commissioners to report to Our Governor in Council the result of their investigation.

AND WE DO FURTHER appoint the said the HONORABLE MR. JUSTICE W. F. CARROLL to be Chairman of Our said Commission.

IN TESTIMONY WHEREOF We have caused these Our Letters to be made Patent and the Great Seal of Canada to be hereunto affixed.

WITNESS; Our Dear Uncle, Our Right Trusty and Right Well-beloved Cousin and Counsellor, Alexander Augustus Frederick George, Earl of Athlone, Knight of Our Most Noble Order of the Garter, a Member of Our Most Honourable Privy Council, Knight Grand Cross of Our Most Honourable Order of the Bath, Grand Master of Our Most Distinguished Order of Saint Michael and Saint George, Knight Grand Cross of Our Royal Victorian Order, Companion of Our Distinguished Service Order, Colonel in Our Army (retired), having the honorary rank of Major-General, One of Our Personal Aides-de-Camp, Governor General and Commander-in-Chief of Our Dominion of Canada.

AT OUR GOVERNMENT HOUSE, in Our City of Ottawa, this twelfth day of October, in the year of Our Lord one thousand nine hundred and forty-four and in the Eighth year of Our Reign.

BY COMMAND,

(Sgd) E. H. Coleman

UNDER SECRETARY OF STATE.





BY THE CHAIRMAN - That is the authority, gentlemen, under which the Commission is established, and which enables it to conduct an inquiry into the problems of the matters pertaining to the coal industry in Canada, having regard generally to pre-war, present and anticipated post-war conditions and the probable future development of Canada. In addition the Order-in-Council by virtue of which this Commission is issued confers on the Commissioners the powers of delegating to other persons the authority of the Commission regarding the taking of evidence and all the attendant authority necessary.

For some time the Commission has been engaged in the work of organization and there is now a fairly good set-up under the capable guidance of J. J. Frawley, K.C., Commission Counsel, and Dr. Robert Howland, Secretary. Mr. Frawley has had wide experience in work of the kind assigned to the Commission and Dr. Howland has been especially trained for this line of endeavor.

Since the issue of the Commission Mr. Justice McLaurin has visited various coal fields in the United States to gain some knowledge of the coal industry in that country. While there he has also informed himself on many other vital matters that have relevancy to the coal and fuel problems of Canada.

Mr. Angus Morrison has, in the interim, visited the coal producing areas of Western Canada. He knows and appreciates the coal problems there, as also of the East. During his visit he accomplished much in the way of organization from the Commission point of view.

Mr. Frawley and Dr. Howland spent some time in the coal fields of the Maritimes getting a first-hand view of many operations and also visited and had conferences with the governing bodies of every province east of the Great Lakes, as well as conferences with leaders of community efforts and generally those who take a live interest in things that are for the common good of Canada.

This Commission was appointed by the Government of Canada and are approaching the problems involved on behalf of the





people of Canada. Every man, woman and child of our country is or should be interested in the prosperity of the coal industry because coal is a national asset and a national necessity and on its prosperity depends to a very large extent the general welfare of our whole economy. We have so far received splendid co-operation from all classes of every community visited and we ask for a continuance of that co-operation. We are trying to unearth all the vital facts regarding production and distribution of coal which in the end will wipe out much misconception in the public mind regarding the whole question. The press has always been the best agency to cure or kill that widespread cancer--misinformation. We ask for continued co-operation from our newspapers in circulating facts brought to light through the Commission.

We will do our best to get all necessary relevant and reliable information and we hope that the information will be of a character that will enable us to make recommendations, the implementation of which will be beneficial to the industry and to those directly and indirectly interested in its future welfare.

BY MR. FRAWLEY - I am ready to lead the evidence, but I understand there are some opening remarks. As far as I am concerned, the Dominion Coal Company will begin to make presentation of their material, and I see Mr. McNeil is here representing the company, and I leave it to him to say in what order the witnesses should be led.

BY THE CHAIRMAN - I understand that the Vice-President and General-Manager of the Company is here, and he may like to say a word of welcome.

BY MR. H. J. KELLEY - Mr. Chairman and associated Commissioners: It is a real pleasure and privilege for me, on behalf of the Dominion Steel & Coal Corporation, to join in the welcome being extended to you. I should like to include in that welcome your counsel, Mr. Frawley, and the other associates with the work of the Commission. I think the personnel of the Commission has been very happily chosen. Your chairman, with his intimate knowledge of





the east and its coal mining industry, and Mr. Justice McLaurin who knows the west so well, and Mr. Morrison with a good Cape Breton background and a western outlook of many years outstanding, means that I should not dwell with the importance of the task allocated to you. That we all realize. The appointment of this Royal Commission with such a wide field of inquiry is in itself a recognition by our Government of the national importance of the coal mining. The Dominion Steel & Coal Corporation, which produces about 90% of the total coal production of Nova Scotia, needless to say is vitally interested in the work of the Commission. We have endeavored to the best of our ability to prepare briefs for you on the different phases of the industry and its problems. These will be presented for your consideration, and we shall be very glad to supplement them with any further information you desire and which it is within our power to obtain.

I may add our assurance of our sincere desire to be helpful to you wherever possible.

May I also, in closing, express our confidence that from this Commission will come in a report that will point the way to a solution of the problems that confront the coal industry of this country. We are all hoping and praying for the victory that is not yet ours, but which at least now seems assured. In the peace to come we trust that the coal mining industry, as a result of the recommendations made by you, will be able to make a worth while contribution to the prosperity of this Canada of ours. I thank you.

BY MR. McNEIL - I do not know if there are any others who wish to speak in similar vein.

BY THE CHAIRMAN - I was going to tell the Executive of the United Mine Workers that I think perhaps a table down there is intended for them, or part of it anyway.

BY MR. JENKINS - On behalf of District 26 of Nova Scotia we are pleased to welcome the Commission today, and the Union.





will be prepared to assist the Commission in its deliberations, and to give all co-operation possible. The Union feels that without doubt the deliberations carried on by the Commission at this time will bring great beneficial results as far as the coal industry is concerned, in Canada, and I say again that the Union is prepared to give all the assistance that they can to aid the Commission in carrying on its duties.

BY MR. McNEIL - I do not want to prolong the preliminaries but I would like very briefly, and very sincerely, to associate myself with the words of welcome spoken by Mr. Kelley and Mr. Jenkins as well, and also to extend congratulations directly to the Government on the choice of Commissioners. The country east and west is very ably represented, but I am sorry that you didn't choose a better time of the year. Mr. Morrison, at least, should have known better, and you Mr. Chairman, as to the time of sitting in Cape Breton. However, we hope your deliberations will be as pleasant as they can be under the circumstances, and we wish you, and those associated with you, every success in the world.

Mr. Kelley has referred to the fact that we have prepared some briefs. I am merely pinch-hitting at the moment for the Company's counsel, Mr. Forsythe. The main brief will be presented by Dr. Gray. I may also say there are other briefs, one of which will be presented by Mr. McLanders, the General Sales Agent for the Company in Montreal, and another one on research by Mr. McLanders or his assistant, and still another one by Mr. McColl, the General Manager of the Dominion Coal Company.

As I say, what I might call the main brief is to be read by Dr. Gray, and I don't know whether you have any procedure in mind.

BY THE CHAIRMAN - On behalf of the Commission I might say here that we discussed the matter of putting the persons under oath. All the persons who will be presenting briefs are





simply acting, as we have reached the conclusion, more or less as counsel, and the information in that brief is not their own, and they cannot swear to it usually. We are allowing all persons and all bodies interested to present their briefs without being sworn, but when it comes to a question of examination, either by our counsel or others, where they are obliged to state facts, and examination on facts, then we will swear them, and of course other persons who come in to give factual evidence will be sworn. We think that is the proper course.

BY MR. McNEIL - I just want to say that while Dr. Gray is reading he will be only too glad to be interrupted to explain any point which is not clear to the members of the Commission.

BY THE CHAIRMAN - Any interruptions are taken as part of the brief, and then if there is any examination, we will have it.

BY MR. McNEIL - I thought as you went along it would probably tend to the better understanding of the brief if you cleared up anything as you went along.

BY DR. GRAY - I will deal first of all with the General Fuel Problem of Eastern Canada.

BY MR. FRAWLEY - You are appearing here today to present a submission on behalf of the Dominion Coal Company?

A. Yes.

Q. You are an officer of the Dominion Coal Company?

A. I am the Assistant General Manager.

Q. You are Assistant General Manager of the Dominion Coal Co.?

A. Of the Dominion Steel Corporation.

Q. Of the Dominion Steel Corporation?

A. Of the Dominion Steel & Coal Corporation.

Q. And in that capacity you are going to make one of the submissions on behalf of the Dominion Coal Company?

A. No, on behalf of the Dominion Steel & Coal Corporation.

Q. Will you let us have the official copy to be marked as an Exhibit and made part of the Commission's record?

A. (Produced and marked Exhibit S/1.)



BY DR. GRAY - I did intend to begin by reference to one of these charts, but as you cannot see it I will leave that until later. Dealing first with the Fuel Problem of Eastern Canada, which includes the Maritime Provinces, Ontario and Quebec.

Note: (short tons are used in this Memorandum throughout except where otherwise stated).

The 1941 Census gives the following population for Eastern Canada:

	<u>Population</u>	<u>Percentage of Canadian Population</u>
Ontario.....	3,787,655	52.92
Quebec.....	3,331,882	28.96
Maritimes.....	1,130,410	9.83
	<u>8,249,947</u>	<u>71.71</u>

That makes approximately 72% of the population of Canada living east of Lake Superior.

The ordinary coal needs of this large area are best shown by the actual consumption in the typical year 1938, as given below. The figures are also shown for 1941, for purposes of comparison, but cannot be considered typical, as they reflect wartime activity.

	(Short Tons)	
	<u>1938</u>	<u>1941</u>
Anthracite.....	3,692,889	3,917,389
Bituminous.....	15,119,817	24,429,923
:x:	<u>18,812,706</u>	<u>28,347,312</u>

:x: From "Coal Statistics for Canada" - Dominion Bureau of Statistics.

There was also imported into Canada in 1938 coke with a coal equivalent of 658,000 tons, the bulk of which would be consumed in Eastern Canada. In 1941 the coal equivalent of 877,739 tons was imported as coke.

The per capita consumption of coal in Eastern Canada in 1938, (including coal imported in the form of coke), was 2.35 tons, about the same per capita figure as for all Canada. The all Canada per capita figure has risen to 3.24 tons in 1941, and in 1944 is probably in excess of 3.8 tons.





Comparison with the Western Provinces is as follows:

COAL CONSUMPTION IN 1938					
(Short Tons)					
--Consumption of--					
	<u>Anthracite</u>	<u>Bituminous and lignites</u>	<u>Per Capita</u>		
			<u>Anth.</u>	<u>Bit.</u>	<u>Total</u>
Eastern Canada.....	3,692,889	15,758,000	0.45	1.90	2.35
Western Canada.....	21,112	7,753,832	0.07	2.31	2.38
	<u>3,714,001</u>	<u>23,511,832</u>	<u>0.33</u>	<u>2.04</u>	<u>2.37</u>

The figures for 1941 are shown for comparison, but they cannot be considered typical because of war-time activity. In 1938 this Eastern Territory used three million seven hundred thousand tons of anthracite, and in 1941, three million nine hundred odd thousand. Not very much change between the two compared years because anthracite is a domestic fuel and does not vary very greatly. Bituminous, however, in 1938 for that territory was fifteen million tons, while in 1941 it was twenty-four and a half million. A tremendous increase. Those figures are taken from the coal statistics of Canada, the Dominion Bureau, and can be obtained by anyone.

In Eastern Canada one-third only of the coal used in 1938 came from Canadian mines, and in 1944 probably less than one-quarter.

In Western Canada, in direct contrast, virtually all the coal used came from Western mines; that is, out of a total of 7,775,000 tons of coal consumed, 7,716,000 tons came from Western mines.

In other words the West is entirely self-supporting in coal supply.

BY COMMISSIONER MORRISON - Where do you draw the line between Western and Eastern Canada?

A. About Fort William.





This is the striking difference between Eastern and Western Canada in respect to coal usage and source of coal supply. The contrast emphasises, if that were necessary, the lost opportunity, in remedy of this lop-sided situation, which continues so long as Eastern mines are only partially operated.

It is also seen from the figures quoted that anthracite is, for all practical purposes, used only in Eastern Canada. Ninety-five percent of the anthracite imported into Canada is consumed in Quebec and Ontario.

The Maritimes is not importantly an anthracite consuming territory.

It is questionable whether this disproportionate use of anthracite in Central Canada is a necessity or a luxury, in view of the fact that anthracite is an expensive fuel, becoming scarcer and more costly to mine in the United States, where it comes from. Also it is now well demonstrated that coke, made from bituminous coal, is an alternative to anthracite. Bituminous coal reserves in the United States are so large that no anxiety need exist as to future supply, but anthracite reserves are limited.

There is no anthracite in Canada -- (with the exception of a small and unmineable occurrence near Banff, Alta.)

To be self-supplying in coal needs therefore Eastern Canada must obtain annually from some source 15 million tons of bituminous coal and  $3\frac{1}{2}$  million tons of anthracite. If we attempted to use Canadian mined coal to supply all the fuel needs of this territory, including an anthracite alternative made from Canadian coal in the form of coke, 19 million tons of coal is required annually in Eastern Canada.

What are the Canadian coal sources on which Eastern Canada can draw:

These are all in Nova Scotia and New Brunswick, probably  $99\frac{1}{2}$  percent in Nova Scotia.





Against the actual consumption of 19 million tons we may set the actual coal production of Nova Scotia and New Brunswick in 1938, namely, a little over  $6\frac{1}{2}$  million tons, approximately one-third. This figure represents about 75 percent of the output capacity of the Nova Scotia and New Brunswick mines, given full labor supply and uninterrupted even operation through twelve months of the year. That is, 25 percent of Nova Scotia's coal production capacity remains unused, notwithstanding the almost abject need of Central Canada (Ontario and Quebec) for coal supply.

BY THE CHAIRMAN - If you had all the markets of Eastern Canada, have you ever considered how long it would take the Eastern Canada mines to be put in a position where they could supply that?

A. I don't think they could ever do it,

BY THE CHAIRMAN - That is something that is generally misunderstood especially in parts of Canada where coal is being produced. You hear people saying, why is it we are getting American coal when we have all that is necessary ourselves. I think both the miners and the Companies should make that news for the public of this country, the position we are in in so far as supplying the necessities of coal.

A. Yes, perhaps so.

BY COMMISSIONER McLAURIN - In making that statement, you mean that the coal deposits of Nova Scotia are of such a character that their mining capacity would fall short of supplying the Ontario markets?

A. 75% is the part of our present capacity used. We do not use the full 100 percent because we have not been able to sell the coal, on account of the distance of marketing, and other things.

Q. Your maximum production in Nova Scotia deposits would be probably around  $8\frac{1}{2}$  million tons a year.

A. Yes, approximately. I will deal with that later, and I



think Dr. Cameron from Halifax will give you some evidence on that.

The Maritimes coal-industry does not in this national condition of native coal-supply sources quite inadequate to satisfy the needs of Eastern Canada, ask more than that these native sources should be made use of to the full extent of their possibilities. But this much is does ask. And this much it has never been given, except in times of national fuel emergency. These have naturally coincided with wars of Canadian defence, and herein resides the paramount justification of maintaining Maritime coal resources in maximum operation at all times. The Maritime coal mines are an inseparable part of Canadian national defence. It should not be necessary to elaborate on such a patent fact but the point must be made and stressed. Without Maritime coal, the Eastern part of Canada - and our national entity is indivisible - must rely on the friendliness of a neighbor for the one munition of war from which all armaments are forged. Such a condition is the negation of national self-sufficiency and independence.

Additional to the over-riding importance of this inherent inadequacy of coal resources and the national necessity to make the most of what we have, is the part played by the coal-mining industry in producing from the earth a contribution to Canadian national income without which the provincial trade exchanges within Canada would be lamed to an extent that requires to be set out to be appreciated.

The capital invested in coal mining is given in the Dominion Bureau of Statistics, as for 1938:

Nova Scotia.....	\$44,581,178
New Brunswick.....	879,366
	<u>\$45,460,544</u>

The capital value shown is a depreciated value and very much less than the actual amount of money ventured in





coal-mining in Nova Scotia.

Capital invested in discharging plants and agencies outside of Nova Scotia is excluded.

The wage-earners employed - at and about the mines only - were in 1938:

Nova Scotia.....	13,035 persons
New Brunswick.....	<u>1,120 persons</u>
	<u>14,155 "</u>

The coal produced is valued, again using the Bureau's statistics for 1938, at:

Nova Scotia.....	\$22,523,802
New Brunswick.....	<u>1,133,346</u>
	<u>\$23,657,148</u>

BY MR. FRAWLEY - The economics of that valuation, is that all available in the Bureau's office?

A. Yes.

Q. How they arrive at those values?

A. Yes, and I think I deal with that later.

The wages paid out in 1938 to workers at the collieries - not including transportation workers, or employees at distributing points in Quebec and Ontario and elsewhere, totalled:

Nova Scotia.....	\$14,613,472
New Brunswick.....	<u>820,446</u>
	<u>\$15,433,918</u>

BY MR. FRAWLEY - You will notice something there, the capital invested in Nova Scotia is forty-four millions in 1938, and the wages paid out in 1938 were fourteen millions, whereas in New Brunswick the capital invested was eight hundred and seventy nine thousand, and the wages paid out were almost as much, eight hundred and twenty thousand.

A. I think that can be explained by the physical condition of the New Brunswick mines, very shallow and very inexpensive in relation to our deep sub-marine mines.

The amount of wages per ton of coal produced has rapidly increased during the war period. The division of production into above-mentioned wages for 1938 gave a cost of





\$2.54 per ton. A similar calculation for 1941 shows a wages cost of \$2.67 per ton. The figures for 1944 are not available, (except from the Dominion Bureau of Statistics) but the wages cost in 1944 probably exceeds \$5.00 per short ton.

To be added to wages disbursed and making up the value of the coal at the pit-mouth, are the costs of colliery material, rates and taxes, insurance, workmen's compensation, cost of power used in mining operations, etc. Additional to all this, however, are the amounts disbursed between the pit-mouth and the customer, in freight-charges, both rail and water, discharging, docking, storage expenses, and sales cost; affording revenues and livelihood to railway and steam-boat employees, workers in discharging plants, and coal handlers, numbering many persons, scattered throughout the whole of Eastern Canada. The coal-mining industry, starting with work of the miner, and throughout the distribution and usage of coal, is like a fertilizing river, creating wealth in its flow. But if the flow is from outside of Canada another country is benefited and our own national economy is weakened by an outgo of wealth instead of the income from a native source of supply.

Now I will deal with the Present and Prospective uses of bituminous coal in Canada.

Table VIII shows for eighteen years ending 1944 the consumption of "energy" in Canada, and the sources thereof.

I cannot show this at the moment on account of the light, but it is to be found on page 98 of the brief. We will come back to this table later.

Energy means all sources of power supply, coal, hydro electricity, oil, and we have not been able to include wood; but all these are forms of energy which compete with coal, and when we see the chart we will see that coal is losing out in the fight with other forms of energy.



BY MR. FRAWLEY - You include coal used for steam raising and heating, as well as used in processing?

A. Yes, everything.

DR. GRAY (continued)

Setting on one side for present consideration the question of Canadian-mined fuels versus imported fuels, (and leaving our anthracite, used in constant annual quantity solely for domestic heating), the figures disclose a progressive decline in the use of bituminous coal as a source of energy and a more than complementary increase in the use of petroleum and its products (including natural gas) and of water-power energy.

Energy consumption is swollen in wartime. It was very shrunken in the period 1930-33. Allowing for these variations there is discernable (if percentages are used) a consistent tendency, which, projected to January 1947 (the choice of this date having been elsewhere explained) indicates the probable existence at that date of the following conditions:

Population of 12 million by 1947 and per capita energy consumption of 4.9 tons (the average of seventeen years ending 1939 being 4.95 tons per capita, will produce annual energy requirements equivalent to 59 million tons of coal. Using the percentages of the 1939 practice to indicate the tendencies, this annual requirement of energy would be met as follows:

FORECAST FOR 1947  
(Short Tons)

Form of Energy	Percentage	Equivalent in Coal-Tons
Coal - native and imported (including coke).....	51%	30,000,000
Petroleum and Gas.....	17%	10,000,000
Water-Powers.....	32%	19,000,000
	100%	59,000,000

Required for energy users in Canada projecting things so far as one's information can go, into 1947.





This estimate presumes a very large decline in energy consumption when war requirements lessen. In 1944 (see Table VIII) it is probable energy consumption in Canada is in the vicinity of the equivalent of 88 million tons of coal.

And I am suggesting that after the war is over the requirements of energy will drop from the present peak of 88 millions to the equivalent to 59 million tons of coal.

BY THE CHAIRMAN - You have already given us how that compares, the energy required after the war, or 1947, will compare with the energy required in pre-war times?

A. That is set out in the table. That table gives you the comparative figures from 1927 on.

MR. FRAWLEY - In point of fact it is really 1939 almost to a decimal, your forecast for 1947?

A. Yes. I did it as a process of investigation, but it comes out to that.

Q. All you have to do is look at your Table VIII in 1939 and you find exactly the same figures?

A. Yes.

DR. GRAY (continues)

The indicated use of 30 million tons of coal per annum is below the rate of usage from 1927 to 1930, and very much below the rate of usage in the current war period. Coal usage since 1940 is admittedly quite abnormal and unrepresentative of peace-time consumption. In 1944 it has reached the quite unprecedented total of 46 million tons.

It seems probable that the relative proportions of solid fuels versus liquid and gaseous fuels, that is, coal and coke, versus natural gas and petroleum products, will be maintained in balance at about the 1939 relativity (as you pointed out Mr. Frawley) by better combustion practice and resultant economics in the case of coal, and by more complete conversion of crude petroleum into high fractionations of "gasoline" in the case of oil, thus withdrawing from the





market much of the fuel oil that was the chief competitor of coal in industrial power-raising.

BY MR. FRAWLEY - That situation you have just read is a very important thing in British Columbia.

A. Very.

Q. You are giving your view to the Commission that there will be a change in the mechanics out there and that the refineries will go in for high fractionation?

A. I think so, eventually. I deal with that detail later.

DR. GRAY (continues)

But in the Canadian economy, and especially in Eastern Canada, the unknown factor and the one most disturbing to the coal industry, is the development during the war period of water-powers with enormous capacity for generation of electric current to meet a war-time demand that will be - at least for an unknown term of years - greater than peace-time needs.

The enormous jump from 19 million equivalent coal-tons of hydro-electric output in 1939 to 29 million tons in 1944 has to be taken into account in any attempt to estimate Canadian coal needs of the future.

During the war years 1930-1943 there was added to Canadian hydro-electric generating capacity 2,000,000 horse-power.

Regionally, by far the greatest increase took place in the Province of Quebec - a chief market for Nova Scotia coal - where 1,762,000 h.p. or 88 percent of the entire Canadian addition to hydro-electric generating capacity was added in the four years mentioned.

The Annual Report of the Dominion Water and Power Bureau, issued in October 1944, comments as follows:

"With due allowance for the demands of peacetime industry, and the retention of an adequate reserve of power capacity to meet emergent conditions a power surplus of as much as one million horsepower appears as a possibility in Quebec."



Detailed information as to the status of hydro-electric power supply in Eastern Canada, and its competition with bituminous coal in the hitherto accustomed markets for coal produced by the Corporation's coal mines in Nova Scotia, will be separately produced for the information of the Commission. That will be dealt with in extenso by Mr. McLanders.

Similarly detailed information on the competition with coal of petroleum and its products in the accustomed coal-sales territory of the Corporation will be produced together with details of the location of steam-plants using or able to use Nova Scotia coal.

Information will also be produced as to steam-plants in the sales territory of the Corporation which could use Nova Scotia coal insofar as location and transportation costs are favorable, but are unable to do so because of the unsuitable design of existing combustion equipment.

These matters will be dealt with by Mr. McLanders.

(Page 21 follows).





DR. GRAY: This is a graphic delineation of the figures in Table 8 and all these figures are reduced to the equivalency of short tons of coal. In 1927, which is as far back as we have the statistics, the total consumption of coal and all other forms of energy was about 54,000,000 tons and it is now 88,000,000 tons. It has been a steady upward progress except for what we call the depression years, 1931-2-3, when the fall was tremendous. The yellow chart shows Nova Scotia coal, and it is about a level line. It runs from about 12,000,000 tons in 1927 to about 11,000,000 tons at this time. It has fluctuated very little but it has not risen. Then the total coal consumption of Canada was 35,000,000 tons in 1927; it is now 46,000,000 tons. It has increased, but not relatively to the others. Hydro-electric has gone from 13,000,000 tons to 28 3/4 million tons, and petroleum and its products from 5 1/2 million to 13 1/2 million.

I think possibly I might now come back to this other chart. This shows the trend of the Canadian coal situation, the entire Canadian coal situation, from 1903 to this date--42 years. In 1903 I don't suppose the population of Canada was more than 7 1/2 million; it is now climbing up to 12,000,000. In 1903 the entire use of coal in Canada was about 13,000,000 tons, of which Nova Scotia produced 46%. Jumping over the 40 years the use of coal in Canada has gone up to 46,000,000 tons and Nova Scotia's part in that has dropped to 13%. Now there are two tendencies there: there is an increase of population in Canada, an increase of coal used which alters the percentage, but there has been a failure on the whole of Nova Scotia coal to improve its position in the Canadian economy and it is baldly expressed by a fall from 46% in 1903 to a measley 13% at this time.

BY COMMISSIONER McLAURIN: Of course you are not comparing late years, are you? 1939 and '40 might be a better comparison.

DR. GRAY: Yes, that is so.



BY COMMISSIONER McLAURIN: The percentage would still be low but it would not be nearly so exaggerated.

DR. GRAY: Take '39; it would be about 24%. Now although it is a little ahead of the story perhaps I might refer to this percentage. This is the percentage of imported coal in Canadian coal consumption. In 1903 it was 52%; at this time it is around 65%.

BY THE CHAIRMAN: Does that include anthracite?

DR. GRAY: That includes anthracite.

MR. FRAWLEY: To save confusion, let us mark this "Use of Energy in Canada" exhibit S/2, and "Trend of Canadian Coal Situation," exhibit S/3

DR. GRAY: On this line of percentage of imported coal there are two spaces marked yellow, the first of which is the period of increased sales of American coal following the war period which ended in 1918. During that period United States coal came in about 58, 57, 59 per cent of the total Canadian coal consumption.

#### R E C E S S

Resuming our discussion of this yellow line, this period which roughly ran from 1918 to 1926 was a period in which American coal was gaining very rapidly on Nova Scotia coal, as you can see from the low figures to which the percentage of Nova Scotia coal was reduced. Then around 1924 interested parties, which included all sections of public opinion from this Island, went to Ottawa and pressed upon the Government in power at that time the necessity for some assistance in the marketing of Nova Scotia coal. In 1924 a small sub-vention was passed. It was only effective for a short time; it did not come in till the fall and it expired in March of the following year; we were not able to use it before it had gone. Then in '28 railway subventions, assistance to freight rates, became the law by a series of Orders in Council and ever since, from 1928 to the outbreak of war, the beneficial effect upon Nova Scotia coal was marked,





because during that period from 1928 to 1939 the percentage of imported American coal remained persistently low, well below 50%, and the resultant effect was that Nova Scotia production came up. Then of course with 1939 came the war and statistics of production have gone hay-wire since that.

BY THE CHAIRMAN: There were no subventions at all between 1924 and 1928?

DR. GRAY: No.

BY THE CHAIRMAN: And the subventions of 1924 were partly used up by experimenting in the costs of carrying coal?

DR. GRAY: Yes, what was known as the "test movement," I will refer to that later.

Then on page 9 I attempt to answer the question as to what proportion of Canadian energy consumption comes from Canadian sources of supply. It is a table one can hardly read but in 1927 when this tabulation was commenced at Ottawa Canadian coal output was 16,000,000 tons, or 30% of 100%, and in 1944 it was 15 1/2 millions, 3% less. That is, the entire progress made by Canadian coal in that period was a loss of 3%. Water-power electricity in 1927 was the equivalent of 13,000,000 tons; it is now the equivalent of 29,000,000 tons, so taking native sources of supply of all kinds of energy they were in 1927 29 3/4 million tons or 56% of the whole. In 1944 they had risen to 46 1/2 millions, approximately the same percentage of the whole, but the shift had been from coal to electricity with some increase in petroleum.

Now taking imported coal--19,000,000 tons in 1927, 30 1/4 million tons in 1944, and whereas in 1927 35% of our energy was imported coal it is now 60%, and imported oil rose from 4 3/4 million equivalent tons to 11 million.

Now these figures show--they are very difficult to read verbally--they clearly show that while Canada has greatly increased the development of water-powers for generation of electric power, and slightly increased native petroleum production,



coal production lags grievously behind the country's need, and it is not disclosed in these figures but in petroleum and its products, Canada only produces 15% of its use; 85% is imported.

BY MR. FRAWLEY: You include the war years there. Do you have readily available the comparable figures using say '38 or '39 instead of '43?

DR. GRAY: Yes, they are in this Table VIII.

MR. FRAWLEY: It would not be very difficult for you to make a figuration of the same kind as on page 9, using '38 and '39 and excluding the war years?

DR. GRAY: Oh yes, I will do that. Now I deal with Modern Trends of Coal "Carbonisation" Industries; Hydrogenation, and Production of "Gasolene", Plastics, Dyes and Medicines from a Coal Base. Bituminous coal has two main uses. One as a source of energy, the other as a source of chemical elements.

In one case the heat energy is released by combustion, used up, and dissipated to the atmosphere. In the other case the coal substance or part of it is transmuted into materials. A sharp distinction is necessary between these uses. If coal substance is used for one purpose it precludes use of that substance for a different purpose.

In Canada the usage of coal as a source of chemical elements or compounds is confined to coal carbonization industries, that is, gas and coking plants. These use high-volatile coking-coals, known in the trade as "gas-coals". Consideration of coal supply for the carbonization industries can therefore be confined to those limited areas in Canada producing high-volatile coking coals, of which the most important area is the Sydney coalfield.

The beneficiation of lignites for manufacture of an anthracite substitute, or the use of lignites as a material for hydrogenation, as is practised in Europe should, for completeness of this description, be mentioned. These processes are of chief interest in the lignite fields of Western Canada.





The shortage of bituminous coking coal in Canada affects only Eastern Canada. Since 1939, reflecting a period of urgent demand, for coke and gas, the Western Provinces have carbonized an average of 400,000 tons of coal per year, all from western coal mines.

In Eastern Canada, since 1939, out of an annual average of 3,500,000 tons of bituminous coal charged to coke ovens and gas retorts only an average of 1,000,000 tons per year came from Canadian mines.

That is to say, in the most populous area of Canada 71 per cent of the coal-carbonisation industry is supplied by United States coal, and in the Province of Ontario itself--which contains over 50 per cent of the coal-carbonisation works in Canada--all the coal so used is supplied from the United States.

In Eastern Canada all the known coalfields yield coking coals, but only in the Sydney area has the local carbonisation of coal been really important, although coal from this field is, or has been, used for the manufacture of town gas in Halifax, N.S., St. John's, Nfld., Saint John, N.B., Quebec, Montreal and Ottawa. Sydney coal has, in fact, been the standard gas-coal in use in the Maritimes and Quebec Province virtually throughout the life of the public-utility gas industry, and was for many years used for gas-making in Massachusetts.

The coals produced in other Nova Scotian and New Brunswick fields are not available, or equally suitable, for commercial carbonisation either because all the coal mined is locally used, or by reason of unsuitable analysis or coking index of the coal.

Consequently, the future of carbonisation industries in Nova Scotia is confined to the Sydney coal-field, where only in Eastern Canada does coal exist of suitable analysis and in sufficient quantity to support such an industry.

The predecessors of the Dominion Steel and Coal Corporation Limited have, since the beginning of steel manufacture in



the Sydney area, and to date, been pioneers in the use of by-product coke-ovens with recovery of tar-oils and their fractions and of sulphate of ammonia. The primary purpose of these by-product coke-ovens is, and has been, to provide blast-furnace coke.

The first 400 Otto-Hoffman ovens erected in Sydney were contemporary with ovens of same type built in Everett, Mass., by the predecessors of New England Gas and Coke Co., and were, with the Everett plant, the first by-product ovens in North America. By-product ovens have operated continuously ever since in connection with the Sydney Steel Plant.

Improved Otto-Hoffman ovens superseded the original equipment, and later the present Koppers ovens were erected, consisting of three 60-oven batteries, with a carbonising capacity of 2,565 short tons of coal per 24 hours, equivalent to 1,555 tons of coke. A Washery is provided for reduction of ash and sulphur content of the raw coal preparatory to coking. In addition to coke and stripped coke-ovens gases in plant heating, there is produced sulphate of ammonia, tars, light oils, benzol, toluol, xylol, pyridine and solvent R.

A sulphuric-acid plant is provided to make the acid used in sulphate-of-ammonia manufacture.

The tar is piped to the adjacent works of the Dominion Tar and Chemical Company, tar refiners and pitch producers.

The practice on this plant is as complete in its range of products as any coke-plant in Canada, and represents standard modern by-product coke-oven practice in North America. Its distinction consists in that it is the only plant of its size and products-range using Canadian-mined coal, and that it has behind its present-day methods forty-five years of operation and technical experience and development beginning in the time of infancy of by-product coke-oven practice in Europe as well as in North America.

BY THE CHAIRMAN: Taking you back for a moment to "in addition to coke and stripped coke-ovens gases," I know some-





thing of what some of them are but the last four, what are those things? What is toluol?

DR. GRAY: Toluol is the base of trinitrotoluol, for production of explosives.

THE CHAIRMAN: And the next?

DR. GRAY: Xylol, that is a different, slightly different fraction from toluol. Paint.

THE CHAIRMAN: Then the next two, pyridine and solvent R?

DR. GRAY: Pyridine, well I know what it is but I am not quite sure what it is used for.

MR. WEIR: That is used for sulfa powder, it is one of the sulfa drugs, and solvent R is used as a solvent in lacquers and paint, the same as xylol. Pyridine is used now entirely for sulfa. It was formerly used as a solvent in rubber manufacture, but there is not very much of that produced per ton of coal.

DR. GRAY: I might say that this brief is to be supplemented by a more scientific and comprehensive brief on by-products which will be given by Mr. Brown.

The Sydney by-product coke-plant and the separately owned and operated tar-distillation plant of the Dominion Tar and Chemical Company to which the tars produced at the coke-ovens are piped for treatment, is a typical assembly of the by-product coke-oven carbonisation industry as allied with coal-mining and steel manufacture in North American practice. So far as is generally known no coal companies or steel companies on the continent have themselves, as such, ventured into the fields of processing and chemical synthesis that start with raw coal or tar-oils as a foundation material to be worked up.

Invasion of such new and quite untried fields would require new venture capital on a very large scale, new plants, new processes, new staffs of trained men, all contingent on development of new urban markets for new products, in localities situated long distances from the coal-mines. Nor would any of these new fields of chemical processing lead to large augmentation of



the bulk usage of coal. The working-up of tar products is analagous to making watch-springs from pig-iron. The steel used in watch-springs makes little difference at the blast-furnace. Neither would medicines, dyes, etc. be reflected in greatly increased tonnages at the pitheads.

It is unfortunate that the word "by-products" should have become so closely associated with the carbonisation industries. Coke, gas, light oils, tars, ammonia, are in fact the total products of coal carbonisation, except what is sold to the tar distiller. He, in his turn, has his choice of what he wishes to make. If he uses the creosote for preservative paint, he cannot use it for chemical processing. There are so many atoms of carbon and hydrogen in a given weight of raw coal. They can be rearranged in thousands of ways, but no atom can be in two places at one time. One picks his process and makes his choice.

MR. FRAWLEY: Before you leave that, the Sydney plant uses Sydney coal 100%?

DR. GRAY: Yes.

MR. FRAWLEY: A plant in Montreal I am told only uses 33% of Sydney coal?

DR. GRAY: They did before the war, yes.

MR. FRAWLEY: Is there an answer to that, an obvious explanation of that?

BY THE CHAIRMAN: I think Mr. Brown probably will be the man to answer that.

DR. GRAY: I would like to say here something that is not included in the brief but which was an after-thought. I should make some reference to research. About 1927 the Deputy Minister of Mines at Ottawa, Dr. Charles Camsell, instructed the Director of Geological Survey and the Director of Mines Branch to undertake geological, physical and chemical survey of the Sydney Coal Field combined with revision of the Geological Maps. The Geological Maps have been thoroughly revised with the assistance of airplane surveys for filling in of surface detail. Dr.





W. A. Bell, the Paleontologist of the Geological Survey has devoted most of his attention to this work over the last seventeen years.

The Phalen seam has been exhaustively studied by the Fuel Testing Laboratories at Ottawa who have made full chemical tests and microscopical examination of the coal seam which has given valuable information to the mining engineers and those entrusted with the planning of the future of the working of the submarine coal seams in the Sydney area.

Lately the chemical and physical study of the Phalen seam in the Sydney coal field has been extended and enlarged to cover all the coal seams in the Sydney coal field including those operated by the Dominion Coal Company and the Old Sydney Collieries; the coal seams at Springhill and the coal seams of the Acadia Coal Company at Stellarton, and I might say that this service is open and available to any coal operator in the country.

Tests have been carried out at the request of the Company's engineers, not only into the characteristics of each seam but into their behaviour when separated into different sizes and as to the behaviour in combustion in mixture of seams.

One investigation which may be particularly given is that which was carried out over a long period and resulted in the special preparation of harbour seam coal from the Waterford and Sydney Mines collieries by washing for use by the LaSalle Coke Plant of the Montreal Coke and Manufacturing Company, Montreal.

BY THE CHAIRMAN: That is information that is not very generally known, Mr. Gray. That is one of the many things I suggested this morning that the Press might help us out on: to give the people of the country some idea as to what is actually being done in the field of research. You meet men every day who have no knowledge of it and are still keenly interested in the production and distribution of coal. That doesn't mean, of course, that you people down here are not doing research work, does it?



DR. GRAY: Oh no, that is additional to our own research, which will be dealt with by Mr. MacLanders and his staff. I might say, Your Honour, that I brought with me as a sample-- I am not filing it--a report of the study of chemical and physical properties of screened sizes of coal from No. 1B Colliery, the Phalen seam, Sydney area. This is dated 1933. I will just run over the matters it covers in the screen tests, screen analysis and the bulk test, approximate analysis of each screen size, the ultimate analysis, the ash analysis of the screened sizes, that is the analysis of the ash itself, the ash fusion temperatures, the float and sink tests on screened sizes--that is what we call washability curves--the distribution of the fusain of the coal. The fusain is what the miners call "McGuffey"; it is called in the Old Country "mother of coal"; with a general discussion of the results. Now that same study has been given to every coal seam, every colliery in operation by the corporation, and that is only part of the work that these people at Ottawa have done.

MR. FRAWLEY: Is this work done by your company or by Ottawa:

DR. GRAY: No, this is done by Ottawa at our request.

MR. FRAWLEY: We could get a complete description of it and a copy from Ottawa?

DR. GRAY: Yes.

MR. FRAWLEY: Dr. Gray is producing a report of the Department of Mines, Mines Branch, Fuel Research Laboratory, being a study of the chemical and physical properties of screened sizes of coal from 1B Colliery, Phalen seam; dated at Ottawa 14th June, 1933, B. F. Hannel, reported by R. A. Strong.

BY COMMISSIONER MORRISON: Is that the latest you have, 1933?

DR. GRAY: No, that is the earliest.

BY COMMISSIONER MORRISON: They keep you right up to date?

DR. GRAY: Yes, as we request them. I might say that





we realized a good many years ago that the work of the chemist and the geologist and microscopist and a lot of other people had to be combined in a synthesis to enable us to see things clearly.

BY COMMISSIONER MORRISON: What about the geological surveys?

DR. GRAY: Yes, I was just going to bring that in. It is rather curious that we called this research chemical and physical research and whether we started it or whether it was purely coincidental, but the Mines Research Branch in Great Britain have now for years been carrying on a series of studies of coal seams under the same title. We find this work of considerable value and we have utilized Dr. Camsell's aids very greatly and I think all who know that agree they should be given much credit. I will deal now with "Further Processing of Carbonisation and Distillation Products."

Further processing would have, as a basic raw material, the tar-oils. The combustible gases, after yielding up their ammonia content, their tarry and oily constituents, are used for heating purposes in the Steel Plant, as is the coke, or carbon content of the original coal.

Coal is a compound chiefly of hydrogen and carbon, two elements that exist in petroleum, and in many other organic substances. By synthetic combination of these two elements many substances with commercial values can be created, such as, fuels for internal-combustion engines, and resinous compounds forming the basis of varnishes, plastics, and rubber substitutes. Also, by synthesis, medicines and dyes can be made.

Crude petroleum is a natural compound of hydrogen and Carbon, resembling the tarry oils distilled from coal.

If a time comes when petroleum becomes scarce and costly then bituminous coal will serve as a source of synthetic processes, but so long as well-petroleum is plentiful and relatively cheap, as it is now and will be the case for years to



come, coal will not be used as such a source, even in countries like the United States and Great Britain where coal is plentiful and extensively mined.

In Britain there are two viewpoints, one the viewpoint of conservationists, who want to prevent the burning of raw coal and thereby increase the amount of coal carbonised and the recovery of coal by-products. This viewpoint is also partly an aesthetic one arising from the desire for a clean countryside. The opposite viewpoint is that of people whose livelihood is affected adversely or favorably by restricted or increased tonnages of coal mined. They want to see plentiful employment based on coal production.

But both viewpoints are reconciled in acknowledging that coal comes second in richness to petroleum as a source of hydrocarbons.

The tar-oils residue of the Sydney By-products Plant is partially refined in Sydney but any further chemical processing or synthetic manufactures are more likely to develop in metropolitan localities, as Montreal or Toronto, where coal-tar oils are available and cheaply collectible from the large coke-oven plants in existence there, using United States coal, in the same localities as large petroleum-refining plants.

MR. FRAWLEY: You speak of the plentifulness of petroleum. Petroleum is only plentiful when one includes the United States along with Canada?

DR. GRAY: Yes. You had better ask Mr. Morrison about that. They have the Turner Valley.

MR. FRAWLEY: But when you speak here, "So long as well-petroleum is plentiful and relatively cheap," that is envisaging both sources of supply, Canada and the United States?

DR. GRAY: And South America. It is the source from which our big Imperial plant does its own refining in Halifax.

MR. FRAWLEY: So that you regard the United States supplies as being almost, you might say, our own supply?

DR. GRAY: Well, I hadn't thought actually along those





lines, but they are. We will show you a map later which shows the pipe-lines carrying oil from the United States into our market. You see 85% of our crude oil supply comes from outside Canada.

MR. FRAWLEY: That is not an alarming situation as you would regard it?

DR. GRAY: No, from the point of view of the coal producer it is a rather favorable situation, because oil is our natural enemy.

MR. FRAWLEY: Still the enemy is coming in pretty openly.

DR. GRAY: To continue: The large-scale usage of bituminous coal for synthetic processing will naturally develop where the coal can be mined most cheaply and Nova Scotia is not such a district.

The process now termed "hydrogenation" is a development of "Berginisation" (after Dr. Bergins, the inventor) who attempted and technically succeeded in "liquifying" coal by subjecting powdered coal to nascent hydrogen, and producing, in effect, a crude petroleum.

Later developments under Imperial Chemicals Ltd., in Britain, have abandoned the use of raw coal as a base material, and have substituted coal-tar oils and creosotes of varying density, collected from by-product coke-plants, gasworks, and low temperature plants primarily intended to make de-volatilised "smokeless" fuels. These tar-oils are hydrogenated and a satisfactory "motor-spirit" is being produced, which, under wartime necessities, has been of the greatest value to Britain. But, notwithstanding the undoubted technical success of these developments, the cost of the "motor-spirit" so produced is greater than the laid-down cost of imported gasoline, and is made financially feasible only by Government subsidies.

In North America commercial economy, when the balance comes to be struck between crude petroleum and raw coal as a source of hydro-carbons for chemical synthesis, the preference will go to petroleum on the ground of cost of production so long



as flowing petroleum remains plentiful. High-pressure hydrogenation processes are especially adapted to crude petroleum and will convert all of the crude into gasoline without production of heavy fuel-oil.

BY THE CHAIRMAN: Did that Berginisation plan become a commercial actuality?

DR. GRAY: It is a commercial actuality but it is protected by I think a duty of 8 pence a gallon on imported gasoline.

BY THE CHAIRMAN: They combine various other operations with the Bergins system and make it one large operation, do they not? I noticed a report from Dr. Stewart. He and a scientist went over to Germany I think around 1922. They made a report on that but I couldn't learn from that how successful the enterprise was.

DR. GRAY: I would say that all these processes would be commercially impossible without the urge of war. They are war products; they are not commercial.

MR. FRAWLEY: Or the disappearance of petroleum supply?

DR. GRAY: Yes. Well, of course in Europe they have a very meagre petroleum supply. They have a little in Germany but very little. Dr. Camsell went over before the war and investigated that particular phase of the German situation.

The cost of producing gasoline from coal was recently stated by Mr. Harold Ickes (Petroleum Administrator and Solid Fuels Coordinator in the United States) to be from two to four times the cost of gasoline from petroleum. And this is on the basis of present petroleum refining practice without recourse to hydrogenation.

For completeness mention should be made of the Fischer-Tropsch synthetic process which uses water-gas as the basis of "oil-from-coal." The gas can be made from coke alone, from coke and coke-oven gas, or from coal by complete gasification. No plants have been erected outside Germany. The process is more costly to establish and operate even than hydrogenation processes.





The trend to these synthetic processes is one forced on countries having no native flowing petroleum, or an insufficient supply.

In respect to the suitability of the coals mined in the Sydney Field for carbonisation or hydrogenation processes and further refinement of the products yielded, it is only necessary to state these coals are the best in Canada for such a purpose, having a low-ash high-volatile content. There is no question about this suitability. But, as previously stated, these coals are relatively costly to mine.

The question is, are these coals a more profitable source of local synthetic hydrocarbon industries than crude petroleum, having in mind the inadequate tonnages of bituminous coking-coal in Eastern Canada, and the constant necessity to import bituminous coal to make up the deficiency?

The viewpoint which seems likely to prevail both in Britain and in the United States is that petroleum-refining, shale-oil refining and coal processing should be operated under a system of pooling the by-products of petroleum refining, that is, fuel-oils, lubricants, waxes, solvents, with the identical by-products of refining and fractionation of coal tar-oils. In eastern Canada, however, the maximum possible production of native bituminous coal is insufficient to supply the solid fuel needs of the country.

BY COMMISSIONER MORRISON: When you say "the country" you mean Eastern Canada?

DR. GRAY: Eastern Canada. Now these are only the highlights of a very complex subject and Mr. W. T. Brown, whose specialty is coke-oven production, will give you further evidence later on. Now we come to the part played by the coal enterprise of Dominion Steel and Coal Corporation Ltd. in the economy of the Province of Nova Scotia. The whole enterprise of this Corporation is based on coal production. With its predecessors it has been for over fifty years the source of livelihood for a large part of the population of Nova Scotia, and a not incon-



siderable number of people in Eastern Canada as a whole.

The extent of the operations of the Corporation are shown by the under-mentioned particulars of money disbursements, which include all plants and mines in the Maritimes and Quebec Province, and Newfoundland, but do not include plants and activities in Ontario.

BY COMMISSIONER MORRISON: That includes steel of course?

DR. GRAY: Oh yes, that is the Corporation.

MR. FRAWLEY: And the mines in Newfoundland?

DR. GRAY: And the mines in Newfoundland, yes. We have taken the year 1942.

Average Number of Employees ..... 25,622

Disbursements:

Wages and Salaries (including Pensions and Workmen's Compensation Assessments).....	\$44,822,632
Taxes.....	3,138,194
Royalties on Coal mined paid to Provincial Treasury .....	668,724

Other Disbursements:

Railway Freight, Steamship Hire, Materials and Manufactured goods, etc. ....	48,479,412
	<hr/>
	\$ 97,110,962

BY COMMISSIONER MORRISON: In regard to royalties, can we have a breakdown as to how much that is per ton, and affecting the different areas?

DR. GRAY: Yes, we can give you that.

BY THE CHAIRMAN: I suppose you would not care to venture a suggestion as to why the coal royalties are so heavy. I think it is 12 1/2 cents in this part of the country and about half that in Western Canada. Is there any particular reason that comes to your mind as to why that should be?

DR. GRAY: Well, in Nova Scotia the coal seams are owned by the Government.

BY THE CHAIRMAN: Well, they are in the West too.

MR. FRAWLEY: Except that which had been alienated to the Canadian Pacific Railway and the Hudson's Bay Company.

BY THE CHAIRMAN: Coal mined from coal areas owned by





the Alberta and British Columbia Governments only carry royalties I think of 5 cents a ton; here it is 12 1/2 cents. I don't see very much reason for it myself.

MR. GR. WLEY: It's all right if you can get it but it might turn out to be a burden on the industry. I presume we will hear from the Provincial Government as to what they think of that rate of royalty/

DR. GRAY: This disbursement of nearly one hundred million dollars represents, in effect, a contribution to national wealth created by the bringing of iron-ore and fluxes from Newfoundland to the coal of Nova Scotia. It was the existence of coal that made the opportunity for development of a Steel Plant in Sydney. With this is combined a chemical industry based on coking processes and coal by-products, in itself of great importance.

MR. FRAWLEY: Going back to those figures, I suppose you have a staff that can break them down and make them up again with the greatest of ease and if we ask for information on per ton costs we can get it quite readily?

DR. GRAY: Oh yes.

BY THE CHAIRMAN: My colleagues want to know what fluxes are?

DR. GRAY: It is necessary in the smelting of iron. Limestone.

MR. FRAWLEY: Do you have to bring the limestone from Newfoundland?

DR. GRAY: Yes sir. The volume on "National Income of Canada" for 1919-38 (Dominion Bureau of Statistics) gives the per capita income in Nova Scotia in 1938 as \$290.00 per annum and the "National Income" payments in Nova Scotia as \$158,850,000 in that year.

The significance of the "commodity-producing value" of the coal mined in Nova Scotia is seen by the figures for 1939, namely:



Value of Coal mined in Nova Scotia in 1939....	\$25,611,271
Per capita annual value to Nova Scotia (560,000 population) .....	45
Wages paid to workers at collieries (13,035 persons) .....	14,613,472
Annual income per worker .....	1,121.00

MR. FRAWLEY: Do you happen to know whether that value figure of 25 million dollars, is that pithead value or selling price or what is it?

DR. GRAY: I think that is pithead value. It is very difficult to put a value on our coal any way other than pithead because its delivered costs include freight and other things.

MR. FRAWLEY: Going back to page 21 and looking at this figure of wages paid, do you happen to know whether that is gross or after deductions of Union dues and such-like things?

DR. GRAY: Oh, that is gross.

MR. FRAWLEY: All of that didn't reach the miners' pocket

COMMISSIONER McLAURIN: It reached him the same way as anybody's else's gross does.

DR. GRAY: That was the company's pay-rolls. As mentioned, the full "commodity-producing" effect of the coal-mining activities of the Corporation as the basis and starting-point of its coal-steel-transportation enterprise, has been expanded into disbursements totalling nearly one hundred million dollars.

While, of course, in this calculation there is added to the value of the coal mined, that of iron-ore, limestone, fluxes, ferro-alloys and other materials entering into steel manufacture, and also fabrication and transportation costs, yet if the coal were not mined, none of these consequent activities would follow because their source would be cut off.

Therefore it would be meaningless to take the annual income of Nova Scotia of, say, \$16,000,000 and assume that if coal production of the value of \$22 1/2 millions were to fail, there would be still left to Nova Scotia \$137 1/2 millions of annual income. There would be little industrial or transportation activity left in the Province if coal production were to cease. There is probably no instance in Canadian economy where





so large a percentage of the population depends directly or indirectly on this one natural resource as in Nova Scotia.

The influence of this coal-steel industry on the economic life of Nova Scotia is shown by the following population statistics:

Population	1911	1941
All Nova Scotia.....	492,000	578,000
In the Coal and Steel towns associated with the operations of the Dominion Steel & Coal Corporation .....	75,620	119,507
Percentage .....	15.3%	20.5%

All increases in Nova Scotia population recorded by the 1941 census over the figures of 1911 are associated with the coal-steel activities of the Corporation. This increase was:

For all Nova Scotia ..... 17 per cent

For the coal-steel centres..... 58 per cent

MR. FRAWLEY: The conclusion is not that there was only an increase from 15.3 to 20.5 per cent in what you might call the Dominion towns and a jump from 17 to 58 in all the coal and steel towns?

DR. GRAY: No, I mean the increase in population in 30 years was 17% but in the towns associated with coal and steel industries that increase was 58%. In other words, in other parts of Nova Scotia there was a decline in the population.

A memorandum presented to the Federal Cabinet by the Premier of Nova Scotia in 1924--asking for transportation subventions and increased protective duties on imported coal stated:

"Only in the towns and cities where there has been a  
"development of coal-mining and steel manufacture has there  
"been any increase in the population. But for the existence  
"of these industries the population of Nova Scotia would have  
"shown a decrease."

This statement could be made today with even greater emphasis.

Copy is attached for the information of the Commission of a Submission made in September 1943 to Dr. R. MacGregor Dawson as Commissioner to investigate for the Nova Scotia Govern-



ment the present status of Provincial Development of Nova Scotia as bearing on questions of Post-war Rehabilitation. It deals fully with the operations of the Dominion Steel & Coal Corporation Ltd. both in coal-mining and coal sales and distribution, and in steel manufacture. The position of the Corporation is especially reviewed as a main source of employment and wages in the Province.

BY THE COMMISSIONER: Has that Dawson Report been made public?

DR. GRAY: No, not yet. I understand it is made but it has not been printed. You will find in that Submission a description of every unit of the Corporation and at the end is an appendix which shows all the equipment of the Sydney Steel Plant. We thought it advisable to include this as it was made 18 months ago at a time when we were considering post-war rehabilitation, and written of course without any prejudice to the present situation.

Dealing now with the part of the Corporation in the economy of Eastern Canada: the livelihood of Nova Scotians is eminently and admittedly bound up with the state of the coal industry. But the economic interests of all Eastern Canada are bound up with the purchasing power of the people of Nova Scotia, so very much of which is spent to buy the manufactures of Central Canada.

The local expenditure of the coal companies--and the associated steel industry--include such local produce as mine timber, lumber, hay, etc.; of municipal and provincial taxes and coal royalty payments. Outside, however, of agricultural produce and fish supplies, the greater part of the purchasing power of the wage-earners and of the industry upon the materials and equipment used in coal-mining and steel manufacture is spent on purchases from the large national industries of Quebec and Ontario. The wage-earners obtain most of their household furnishings, woollens, textiles, electrical supplies, radios, refrigerators, washing-machines and tires, building and plumbing supplies, glass, books, clothing, boots, stationery and paper supplies, meats, flour and



groceries; in fact, the great bulk of their personal and family needs, from Central Canada. Similarly, all Canadian machinery and equipment used in the coal and steel industries, outside locally-made castings and sheet-metal fabrication, comes from the manufacturing centres of Quebec and Ontario.

The existence in Nova Scotia of a potential source of coal supply which could be immediately increased by 25 per cent and thereby correspondingly enlarge the purchasing power of the Nova Scotia people, is worthy of the considerate attention of the people of Central Canada.

It also merits their gravest consideration that if the coal industry of Nova Scotia be not maintained; if it should be allowed to decline because Central Canada gets its coal from outside the national boundaries, then the resulting destruction of Nova Scotia purchasing power will destroy also the livelihood of Central Canadian workers in proportion to the extent of the calamity that would visit Nova Scotia. No raw material can be considered cheap in Canadian economy if its purchase outside of Canada deprives Canadian workmen of their work.

Few will deny this statement in general application but in the case of Eastern Canada's coal supply its denial in practice is less harmful to Canadian nationhood than if our national policies fail to recognize the need to mine all the coal possible in Eastern Canada as a measure of national defence and, I might add, national unity.

Then there is a short paragraph on the Consumption of Coal in Steel Manufacture and Steel Fabrication in Nova Scotia by the Corporation. Table VII shows from 1913 to 1943 the coal used in the Sydney Steel Plant and in the Sydney Mines and Trenton Plants of the Nova Scotia Steel & Coal Company and its successors, with five-year averages of annual use and percentages of total Corporation annual coal production. This percentage will be seen to have varied considerably with trade conditions.

MR. FRAWLEY: Why do you mention Sydney Mines?

DR. GRAY: Well, there was a steel plant there.

12.15 P.M. - ADJOURNMENT TO 2.15 P.M.





Tuesday, January 16th, 1945 - 2:15 P.M.

BY MR. FRAWLEY - Will you just continue Dr. Gray.

BY DR. GRAY - I don't think I finished the paragraph on the steel.. Over the 31 years shown in the table an average of 18 percent of all the coal mined by the Corporation has been used in the steel side of its enterprise. If the coal used in the Sydney Steel Plant, coming from the Cape Breton mines of the Dominion Coal Company, be compared with the total output of these mines, then over the 31 years shown the figure is 22 percent. These mines have supplied all the coal used in the Sydney Plants, totalling for the period 1900-1943, inclusive, 25 million long tons.

BY COMMISSIONER MORRISON - Do you sell your coal to the Steel Plant on the long ton?

A. Yes.

Q. They are on the same basis with Mr. Colburn?

A. Yes. In fact we sell all our coal in Nova Scotia on the long ton.

DR. GRAY (continues)

#### COAL PRODUCTION - PRE-WAR and POST-WAR.

For the purpose of this Memorandum the view is taken that the war years from 1940 to whatever date may see restoration of peace are, because of their abnormality, not a dependable basis for consideration of long-term questions affecting Canadian Coal Supply.

The accumulated experience as at 1939 will therefore be used as a basis, and the date of resumption of peacetime procedure in Canadian industry is taken as at January 1947.

(This is the procedure followed by a Committee of the Engineering Institute of Canada in a treatise on Post-War Planning, prepared February 1944.)

#### PRODUCTION OF THE PROVINCE OF NOVA SCOTIA.

Allowance has to be made for changes in the production capacity of some coal areas in Nova Scotia occurring since 1939 and as this may stand at January 1947.

Table "I" shows that in 1939 the Nova Scotia



collieries produced approximately seven million short tons of coal, but that the collieries could have produced at least one million tons more had coal sales permitted working full time.

We figured that the production capacity was 8 million 200 thousand short tons, and the actual achieved production was 7 million and 51 thousand short tons.

During the war period up to the date of this Memorandum (December 1944) the production of coal has been reduced by about 30 percent through lack of face-workers. The mines have been maintained in as good productive condition as the shortage of men has permitted, but this shortage has necessarily limited the advance development and permanent construction of airways, travelling roads and haulages that under normal conditions of labor supply accompanies unceasingly the daily work of coal production.

The date assumed by this memorandum for resumption of working conditions similar to those of 1939 is January 1947. This assumes seven years of operation under limiting war conditions which have to be taken into account in an attempt to forecast output possibilities at the close of such a period of restricted operations.

Also in this assumed period, changes will have resulted from exhaustion of the mineable territory of some individual collieries and some mining districts. A reduction of production capacity may be expected in Inverness County and in the Joggins area.

The figures of Table "I" indicate (very roughly, of course) what the course of production capacity may be. The figures show a probable production capacity as at January 1947 of 7,600,000 short tons, a tonnage figure which is in excess of the 1939 actual production by half a million tons. Reference to Table II will show also that for 40 years ending 1939 the annual coal production of the Nova Scotia mines has averaged 6,100,000 net tons, although throughout this period the





productive capacity of the mines - given the markets - was between 7,500,000 and 8,000,000 net tons. This will be seen to be correct if one looks at the production in those years when extent of coal sales permitted maximum operation of the mines, of which the following years are examples,

	<u>Annual Production</u> (Short Tons)	<u>Averages</u>
1912	7,785,888)	
1913	7,980,073)	
1914	7,370,924)	7,650,000
1915	7,463,370.	
1927	7,071,876)	
1929	7,056,133)	7,060,000
1939	7,051,176)	
1940	7,848,921)	
1941	7,387,762)	7,370,000
1942	7,204,752)	

The year 1913 was, and remains, the peak of coal production in Nova Scotia.

1940 was just before the shortage of men hit the industry so badly.

BY MR. FRAWLEY - There was no freight sub-vention in 1913?

A. No.

Q. Where did all that coal go?

A. That was sold chiefly in the Montreal market, and a great deal was used in the steel plant, and a great deal in local bunkers. In fact the sales of bunkers in the last war very much exceeded that in this war because of the increase in oil using ships. There were very few in the last war.

Q. It is very interesting to reflect that your biggest year was back where you had no subventions. But you say the ship bunkers accounted for a great deal?

A. Yes. ships used to come in and take a deck load of coal in those days because they were short on the other side.

BY COMMISSIONER MORRISON - You are taking into consideration coal mined by your competitors as well?

A. Yes, and hydro electricity.

Q. I should not perhaps say competitors.



A. Well, they are competitors. This is Nova Scotia. I think during the last war something like 35 percent of coal production was used in the steel production.

Q. And you are using now, about that?

A. About that.

BY THE CHAIRMAN - And the mines of Inverness, Port Hood was operating then at quite a capacity?

A. Yes.

Q. And the Inverness mines were in fairly good condition then?

A. Yes.

DR. GRAY (continues)

In none of the above mentioned periods of large production in Nova Scotia was there full all-year-round operation with full force of workmen.

So I think it quite fair to say we had a productive capacity of between  $7\frac{1}{2}$  and 8 million tons, but our actual output was only something like six million eight hundred thousand tons, due to lack of markets. Even in these maximum years we did not obtain all we could if we had worked winter and summer all the time.

It may be concluded, therefore, that at the close of hostilities, when the men who have left the mines come home to their former work, the coal mines in Nova Scotia will be in a position to produce and will require to enable them to produce, a market of between seven and eight million short tons of coal each year. This tonnage would give reasonably full employment to the Nova Scotia collieries the year round at an even monthly rate of production.

I say even monthly rate, because if you lose coal in the winter you cannot regain it in the summer.

So far as production is concerned the mines of the Dominion Steel and Coal Corporation will provide 90 percent of the coal mines in Nova Scotia.

Taking a long-range view affecting, say, the



next 25 years following the end of the War, the relative proportion of the total coal production of Nova Scotia coming from the mines operated by the Dominion Steel & Coal Corporation will increase. The relative importance of the Sydney Coalfield and the submarine mines of the Dominion Coal Company and of the Old Sydney Collieries, on and around Sydney Harbor, will notably increase, because of the very large reserve of good quality caking-coal in this Field.

This condition will have much bearing on the questions of coal DISTRIBUTION, as the Sydney Coalfield always was and must continue to be the main source of water-borne coal in Nova Scotia.

Production from mines in Inverness County and in the Joggins area cannot increase in the future, except in an impermanent manner, and will gradually decline through exhaustion of mineable coal.

#### DISTRIBUTION

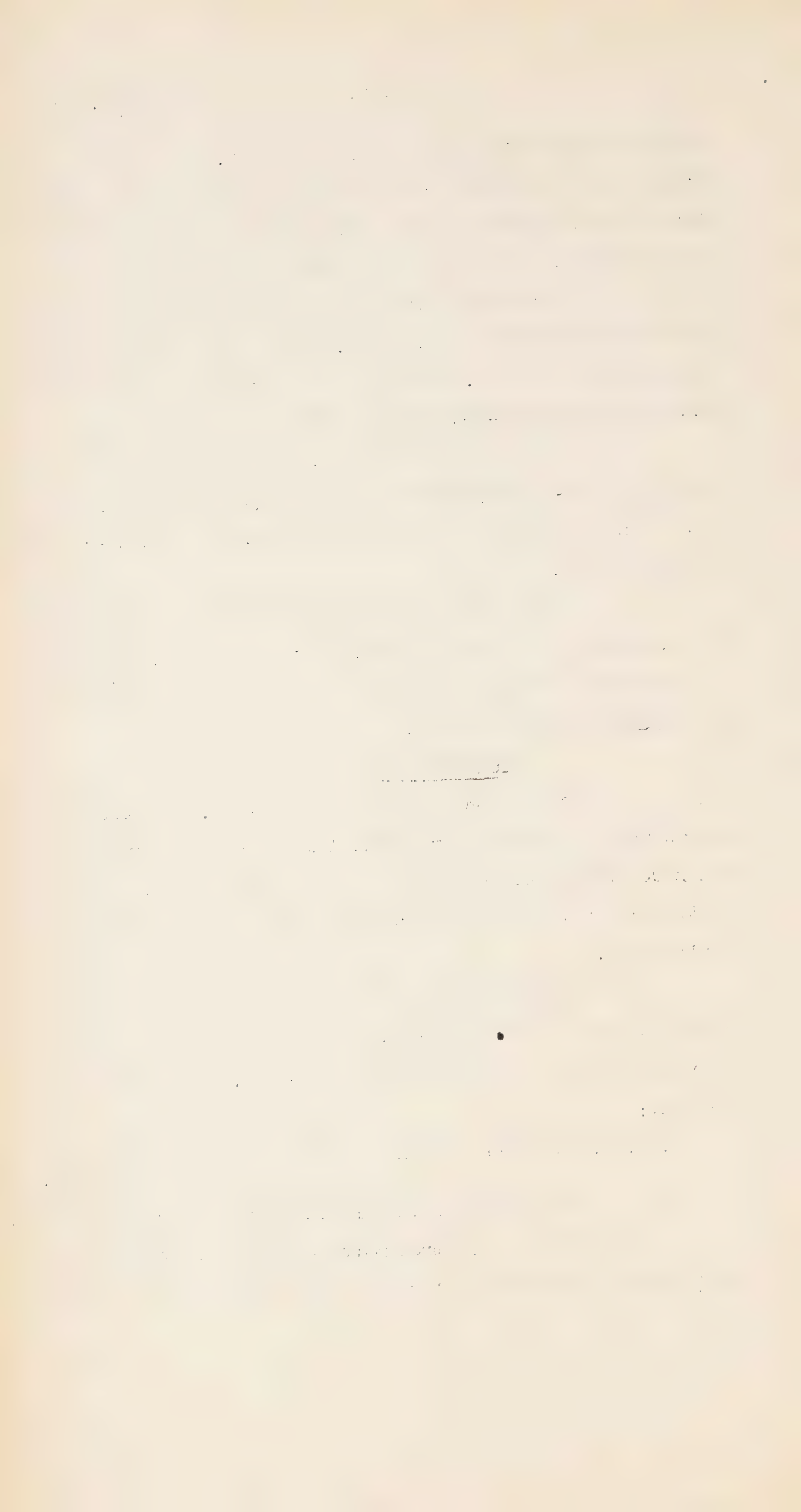
In respect to coal distribution, war conditions have caused a departure from normal modes of transportation and a re-arrangement of markets that renders any war-time statistics of little use in considerations of long-range application.

The immediate pre-war years seem probably the best period for use as such a basis. Table III shows that using the average of the 5-year period, 1937-1939, Nova Scotia coal was used:

- a. .... 46 percent in the Maritime Provinces and  
Newfoundland.
- b. .... 54 percent in the provinces of Quebec and Ontario.

Projecting this proportion of distribution into the 1947 estimate (see Table I) we get the following conditions:





Dr. Gray

1. Sales on the basis of the three-year average 1937-1939 in Central Canada (54 percent) .....	<u>Short Tons</u> 3,300,000
2. Sales on the same basis in the Maritimes and Newfoundland (46 percent).....	2,900,000
3. Insufficiency of sales, on this basis, to give all-year round work to the Nova Scotia coal mines.....	<u>1,400,000</u>
	<u>7,600,000.</u>

During the three-year period 1937-1939 it required assistance from the Federal Treasury in the form of freight subventions to the extent of an average sum per year approaching \$2,000,000 to market Nova Scotia coal in Central Canada. This was done under the supervision of the Dominion Fuel Board. The coal so marketed amounted to an average of 57 percent of all Nova Scotia coal sold in Central Canada. The Freight subventions, averaged over the three years 1937-1939 amounted to slightly over one dollar per ton. None of this sales tonnage, averaging nearly 2,000,000 tons per year, could have been sold without the transportation subvention mentioned. Had it not been given, coal production in Nova Scotia would have been lessened to an average of not more than 5,000,000 short tons per year in the immediate pre-war period. This would represent production at only 60 percent of full-time capacity, or 40 percent of idle time at the mines, say three days work at the mines per week, on the basis of a five-day week as used in this Memorandum.

BY MR. FRAWLEY - Dr. Gray, that 1,400,000 tons which you say represents an insufficiency of sales, where do you contemplate that would go, to the Maritimes and Newfoundland, or to Central Canada?

A. Chiefly to Central Canada. In fact that is the only place it could go.

Q. That would increase that 54% to about what?

A. That would make that 4 million 700 thousand.



DR. GRAY (continues)

THE DISTRIBUTION AND USAGE OF COAL  
MINED IN NOVA SCOTIA.

MARITIME DESTINATIONS.

Reference to Table III will show that industrial and domestic usages of coal in the Maritime Provinces is about as shown below - precise tonnages not being computable. The figures are based on 1937 returns, but for consumption of the Iron and Steel industry the more representative figure of 750,000 tons per year is substituted for 501,685 tons actually used in that industry in 1937. (In 1944 the coal used in iron and steel manufacture is in the vicinity of 1,400,000 short tons).

	(short Tons)
Industrial and Domestic usage in the Maritimes	1,650,000
Required in Steel Manufacture (estimated figure)	750,000
Delivered on cars to Railways.....	500,000
Shipped to Newfoundland and elsewhere.....	150,000
Steamships bunkers.....	300,000
Used in and about the Mines.....	<u>600,000</u>
	<u>3,900,000</u>

Note: That Used in and about Mines includes coal supplied to employees.

The difference between that and the former figure is in the amount allowed for the steel industry. For the period ending 1939 there was an average of steel production of one million tons a year as between what the Cape Breton mines of the Coal Company produced, and what they could have produced if they had worked full time, and over that period they only worked 79 percent of full time, or an average of 209 days a year. After 1940 the statistics are not very reliable as an index to the future.

In the depression period importations of Canadian coal dropped as low as 6,600,000 tons, or 30 percent reduction, but in 1932 and 1933 the production of the Dominion Coal Company dropped to 2,000,000 flat tons, and 2½ millions,





which was not much better than half output.

BY MR. FRAWLEY - This Table is confined to the Dominion collieries?

A. This one.

Q. Does that include the north side mines?

A. No.

Q. Or Pictou County?

A. No.

Q. It is not even Cape Breton collieries, but just the Cape Breton collieries of the Dominion Coal Company?

A. Yes, because they are the only collieries that participate very largely in the St. Lawrence trade. The Acadia and Springhill have a land sale outlet.

Q. The North side mines?

A. They work about the same ratio as the Dominion Coal Company. Ours is so large a proportion of the St. Lawrence trade that it can be taken as quite typical.

Table X shows that from 1893 to 1944 the Dominion Coal Company opened 19 mines and closed 15 mines, and at various times worked the Harbour, the Phalen, the Emery and the Gardiner, and at this time they are working 3 mines on the Harbour, 5 on the Phalen, 2 on the Emery and one on the Gardiner seam. And you will find at the end the output per mine through the years, with the daily output of each mine, and I think you will find that is a very very consistent record. We had starting with 7 in 1893, which were brought to 5 in 1894, the number reached as high as 17 in 1913, which was the very peak of production, and is now down to 11. It is tabulized as from 10 to 11 for a number of years past.

That is a statement that requires a little study and cannot be exactly summarized by reading.

Now the quantity of 3,000,000 short tons, which conservatively may be placed at 3-3/4 million short tons, is



unimportant from the transportation viewpoint. Public transportation-systems are involved only in the tonnage moved by rail to industrial and domestic consumers, which is in the vicinity of 1-1/4 million short tons per year. About 300,000 tons of Nova Scotia coal is sent annually by water to Halifax and St. John, N. B. from the loading piers on Sydney Harbour.

The coal used at the mines, in the steel plants, and shipped from the loading piers to Maritime and Newfoundland destinations has only a local movement on colliery railways.

CENTRAL CANADIAN DESTINATIONS - (Ontario and Quebec).

This important part of the markets of Nova Scotia coal has provided an outlet for Nova Scotia coal for the past 50 years, amounting, in the pre-war period 1937-1939, to some 54 percent of the total production of the Province. With small exception this market is an enterprise of the Dominion Steel & Coal Corporation, based, until recent years, on water transportation to a St. Lawrence port of discharge, for local use; or for furtherance to Western destinations in Quebec and Ontario.

THE ST. LAWRENCE COAL MARKET

This sheet-anchor of the Nova Scotia coal-trade in the past is at this time temporarily interrupted by war exigencies, as it was similarly interrupted in the war-years and their aftermath from 1915 to 1922. The market was then lost, and had to be regained, as will be the case after the current war.

For the framing of future coal-trade policies the St. Lawrence market requires to be examined in some detail.

NATIONAL NEED - AS TO QUANTITY OF COAL REQUIRED IN EASTERN CANADA

Table IV shows importations into the provinces of Ontario and Quebec of bituminous coal from the United States from 1920 onwards. (The record in this form does not extend further back). Over the 20 years, (1929-1939) such importations have averaged 12 million short tons annually, and have in



some years (as in 1920, 1928 and 1929) reached as much as 17 million short tons. During the same 20 years the coal mines in Nova Scotia operated at an average annual production of about 6 million short tons, having throughout this whole period possessed a capacity for output of 8 million short tons per year. Confirmation in detail of this assertion is given in Table V. This covers only the Cape Breton mines of the Dominion Coal Company, but it shows very clearly the concurrence of heavy importations of bituminous coal into Ontario and Quebec with only 79 percent of full time operations at the Dominion Coal Cape Breton collieries. These collieries produce on an average about half of the entire Nova Scotia output of coal, but they are more acutely prejudiced by bituminous coal importations into Ontario and Quebec than other coal mines in Nova Scotia because of their great reliance on this Central Canadian market, of which more detailed mention is made elsewhere.

The figures of bituminous coal imports into Ontario and Quebec do not include a substantial tonnage of bituminous coal imported into Quebec Province from Great Britain which similarly displaces Nova Scotia coal in the St. Lawrence market.

The National need lies in the circumstance that even with the maximum all-year round operations of the Nova Scotia collieries that would and could result from maximum use of Nova Scotia coal in Ontario and Quebec, there would still remain the necessity to import from the United States into these provinces some 10 to 12 million short tons of bituminous coal.

#### NATIONAL NEED.

Reasonably maximum operation of the coal-mines of Nova Scotia has been found possible only in wartime, as Table II discloses. In peacetime the industry languishes. This is apart from the catastrophic reduction in colliery working-time in 1931 to 1933, when world-wide trade depression accentuated to a





perilous degree the usual neglect of Nova Scotia coal as a Canadian source of fuel supply. The reduction in 1931-33 in bituminous-coal imports into Ontario and Quebec was in the vicinity of 30 percent, but reference to Table V will show that in 1932 the output of the Cape Breton mines was reduced by 60 percent.

Table V is a statement of the number of days ~~worked and the resultant annual output of the Dominion Coal Company of the Cape Breton collieries, showing capacity for output on full working time, with calculation of lost production resulting from enforced idle time.~~

If the Nova Scotia coal mines are to be considered as a necessary source of coal supply in Canadian national economy and defence, it is obviously necessary to keep them in productive being, because if you don't, when you want them they will not be there.

THE IMPORTANCE OF THE NOVA SCOTIA COLLIERIES IN THE COAL SUPPLY OF EASTERN CANADA VIA THE ST. LAWRENCE RIVER AND WATERWAYS.

Three factors combine to create this importance:

(a) The geographical situation of the Sydney Coalfield at the entrance to the Gulf of St. Lawrence served by a safe commodious harbor.

(b) The present and projected development of the St. Lawrence Waterways from the open Gulf to the Great Lakes constituting the dominating factor in the overseas export and import exchanges of Canada.

(c) The existence along this Waterway of the chief centres of Canadian industry and population.

Yo this may be added that for 50 years the carriage of coal to Montreal and other St. Lawrence ports by water has been carried on, - at first by the Dominion Coal Company, and later by this Company and others associated with it. That business was founded and developed by the Dominion Coal Company.



PRODUCTION AND DISTRIBUTION OF COAL IN CANADA.

The part played by the coal mines of the Dominion Steel & Coal Corporation Ltd. in the production and distribution of coal in Nova Scotia itself and in Canada.

PRODUCTION.

The special part of the Dominion Steel & Coal Corporation's coal-mines in coal production in Nova Scotia is shown by the following percentages of its operation in the four main coalfields of the Province.

<u>COALFIELD</u>	<u>PRODUCTION</u>		Percentage of each coalfield to Total Production of Nova Scotia.
	Corporation	Other Operators	
Sydney-Cape Breton Island	96%	4%	76%
Pictou-Pictou Co., N.S.	60%	40%	10%
Springhill & Joggins Cumberland Co., N.S.	77%	23%	11%
<del>Inverness-Cape Breton Island</del>	<del>---</del>	<del>100%</del>	<del>3%</del>
	89%	11%	100%

The Coal Company has no production at Inverness. The one operation is that carried on by the Provincial Government at Inverness.

These percentages bring out the importance of the Sydney Coalfield, both in respect to the Provincial coal-trade as a whole and the interest of the Corporation therein.

SYDNEY COALFIELD

The whole of the Sydney Coalfield is under lease to the Dominion Coal Company and the Nova Scotia Steel & Coal Co., and is as fully operated by these two Companies as seems advisable having due regard to reserves of coal required for continuity of future operations.

The coal lying above high-water mark has been mined out by operations commencing about 1825, except for an undetermined but small body of coal in the Gardiner seam, the lowest known workable seam in the central area of the field, now being





developed by a new colliery, Dom. No. 25.

The remainder of the coal reserve is under the ocean, and with one exception, access to the unworked submarine coal is through existing coal-shafts at the shore-line and through worked-over areas fringing the shore-line.

The problem of the coal companies working the Sydney Coalfield has been to preserve access to the coal lying under the sea beyond currently operating working-faces, to keep the number of surface openings and attendant mine-establishments to an economic minimum, to operate coal seams of the quality required by changing market demands, and at all time to maintain mine capacity for an annual production suited to current market requirements.

Progress towards and into the submarine area from the land outcroppings of the coal seams has been continuous for a hundred years, but greatly accelerated during fifty years operations of the Dominion Coal Company. Progress has necessarily been in one direction, and always into unknown ground without possibility of advance proving. The technical problems created by and accompanying this advance have been met by local initiative, based on the experience gained, with such consultation as was possible with British mining engineers versed in undersea coal-mining practice.

With assistance of this nature, plus the experience gained by actual working of the coal deposit, the technical personnel of the Company has acquired knowledge of a very special character as this bears on the extraction of coal from the submarine area of the Sydney Coalfield. There has been developed a local technique of unique competence arising out of unique experience. Indeed, the local practice in the winning of undersea coal has become the classic example of such practice in world coal-mining methods and literature. It is no longer possible for the technical staff of the Corporation to obtain more informed outside advice on local undersea coal-mining



problems than their own conclusions. Local experience has now a wider range of time and extent of operation in undersea coal-mining than is to be found elsewhere. That, gentlemen, is not a statement of self-adulation or anything of that kind. It is a statement of fact.

This observation is intended to apply only to the special physical conditions present in the Sydney Coalfield. They are in the main long-distance haulage of coal, remote ventilation and roof-control. These difficulties, as they have arisen, have been met by local initiative and laborious experiment.

Where engineering advice is available for consultation on improvement in equipment design, on the more economical use and transmission of motive power, on questions of rapid underground transportation, and general advance in coal-mining appliances, the Company has always sought such advice. It has, in fact, been a pioneer in such advances, and hopes to continue to be a leader in coal-mining practice.

Referring in particular to the mines of the Dominion Coal Company, a chronological statement of the mines, old and new, operated by the Dominion Coal Company since its incorporation in 1893, a period of half a century, is appended. (See Table X.)

The growth of the Company's coal-mining enterprise in Cape Breton has been impressively consistent. From a group of five small collieries in 1893 (two had been closed the previous year) having an output of less than 800 long tons daily per mine and an annual production of slightly less than 1,000,000 tons for all the mines, the Company operates in 1944 - after a period of fifty years of continuous operation - ten collieries, having a daily production of 1,500 tons per colliery, and an annual productive capacity of  $4\frac{1}{2}$  million tons, long tons.

Wartime man-power shortage reduced the 1943



production to 3,150,000 tons. The 1944 production will be still further reduced. But, as above stated, the actual productive capacity of the mines with full working force is about what it was before the outbreak of war, in the vicinity of  $4\frac{1}{2}$  millions long tons per year for the Dominion Coal Company's collieries.

The table which follows shows in condensed form the remarkable consistency of the production record:

DOMINION COAL COMPANY LIMITED  
CAPE BRETON COLLIERIES

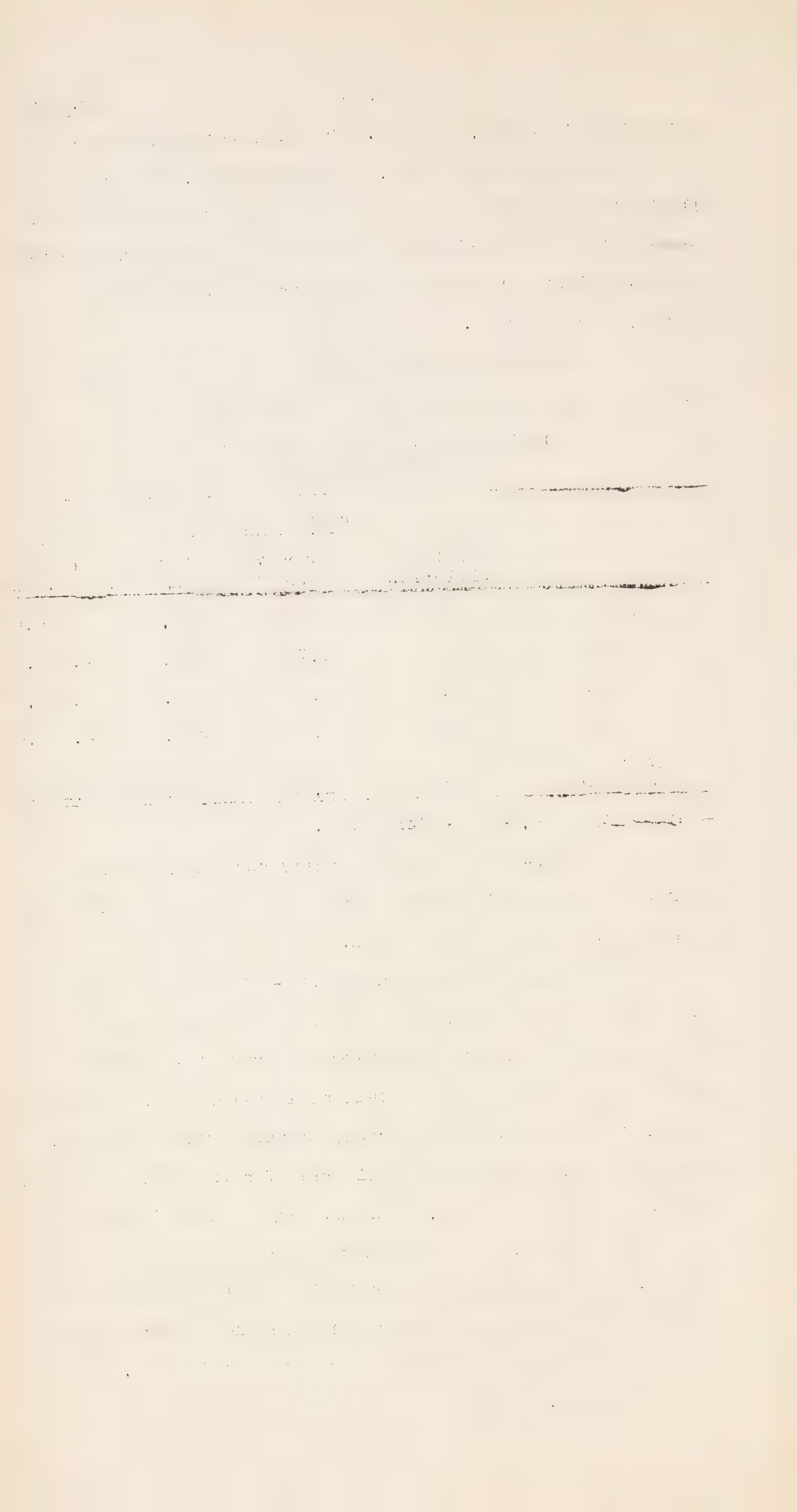
Year	Number of Operating Collieries	<u>OUTPUT PER COLLIERY</u>		Total Annual Output Lg.Tons
		Per Day Long tons	Per Year Long tons	
1894	Five	800	200,000	984,000
1942	Ten	1,700	400,000	3,850,000 /
1943	Ten	1,300	315,000	3,153,000 /
1944	Ten	1,100	300,000	3,000,000
Average of 50 years	Ten	1,200	300,000	3,146,000

/ Capacity is 4,500,000 long tons.

The output of colliery steadily reducing, but that is entirely a matter of man-power and has nothing to do with the colliery operations of the mines.

No good reason is apparent - at least no reason connected with the extent of the reserve of ungotton coal or the planning of colliery operations to work it - why the consistency of this record should be impaired in the immediate future, or in the post-war period, whenever that may start. The present capacity of the collieries for production has been about the same since 1913, with the very notable difference that it is now being produced from ten collieries instead of from seventeen collieries as in 1913. As elsewhere stated, this is not a condition denoting inefficiency of management or failure to provide for the future of coal production, but the precise reverse.





The extent of the reserve of unmined coal in the submarine area is, of course, unknown, and never will be precisely calculable. There is more coal in the ground than it will be feasible to mine, much of the reserve being further under the sea than it will be found possible to work it, so far as present-day knowledge can forecast.

A careful assessment of the conditions which may limit the amount of coal possible to be won commercially from the whole submarine area of the Sydney Coalfield indicates the likelihood that about the present annual tonnage -  $5\frac{1}{2}$  million long tons per annum - can be mined for the next 180 years. This estimate includes the Dominion Coal Company's collieries and the Old Sydney collieries. While no person can foresee the social, national, scientific and physical conditions that will affect the demand for Nova Scotia coal, sufficient is indicated by our knowledge of the Sydney submarine coalfield to hazard the statement that it can produce coal at about the present rate for generations to come.

For the purpose of further planning, any questions touching the sufficiency or insufficiency of the coal reserve can be dismissed. Access to the submarine coal-seams is limited to a shore frontage of some twenty miles, but only twelve miles of this frontage gives feasible access to the full series of coal seams. On the twenty-mile stretch of shore-line first mentioned and situated as near to the shore-cliff as advisable, eight collieries are working submarine coal, namely, proceeding from West to East along the shore-line, as shown in the following table.



In reference to the Sydney Coalfield, I think I can show that better on this map. It is a geological map of the Sydney Coalfields, and it is a revised map prepared by a geological survey. (Map marked Exhibit S/5)

Mr. McColl is, I think, supplying you with some better maps than this, but they will be similar to this.

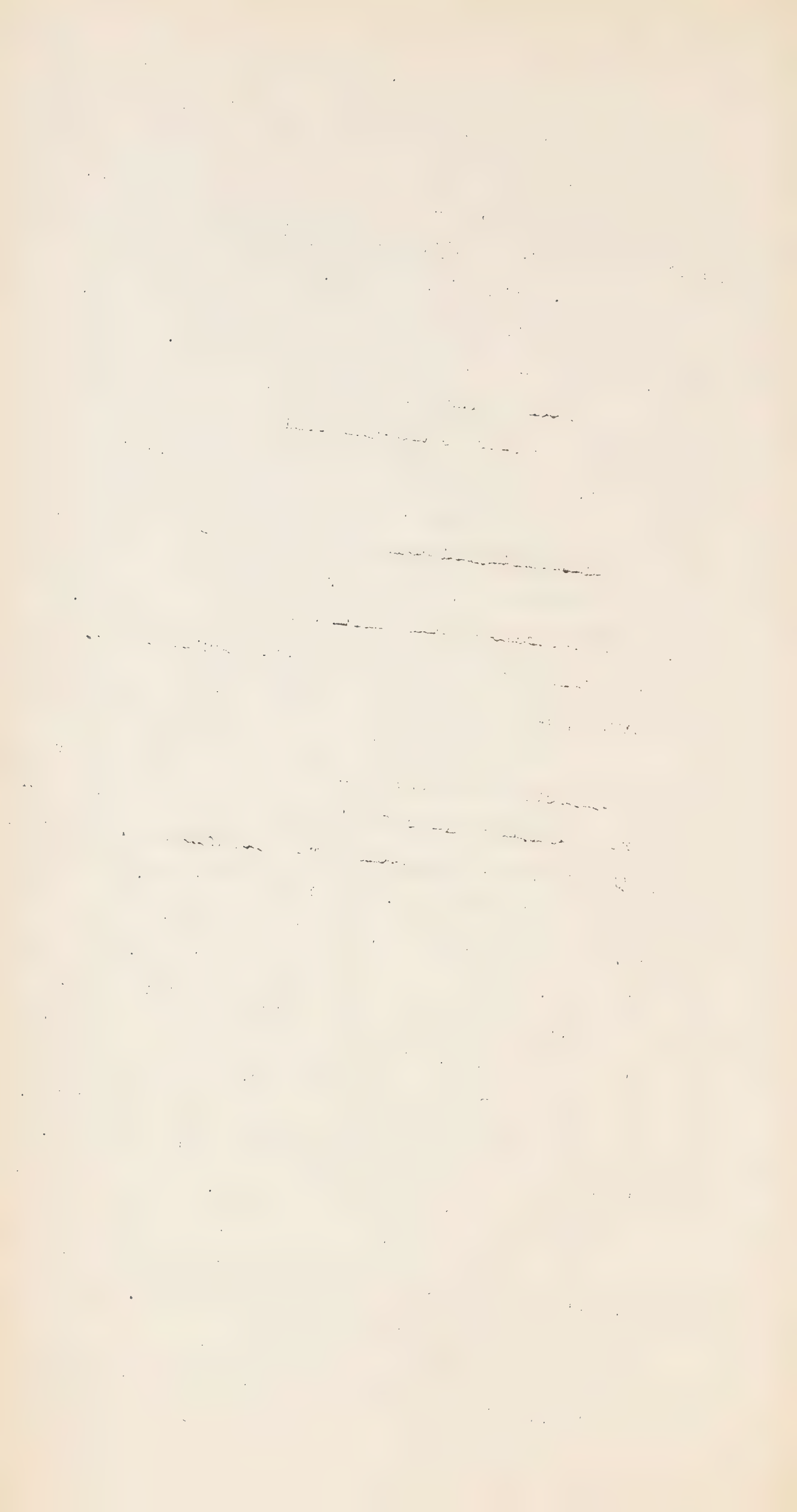
BY MR. FRAWLEY - If you make reference to it, we should have it to ~~check~~ against in the record.

BY DR. GRAY - This is the coal field and all seams are continuous from Cape Delphin to opposite Mira, possibly along an average of 35 to 37 miles. It is a remarkable example of one of the ~~least disturbed~~ coal fields in the world. The coal seams are continuous, and are probably just the core of a great semi-circle of coal which extends under the sea, and which extends probably more in a north easterly direction than otherwise, so that it leads out towards Newfoundland.

The topmost or upper seams in this field are always more persistent and cover a larger area than the lower seams. There is a line which shows the approximate lateral extent of the Hub Seam. It extends from Boularderie Island to somewhere off of Cape Percy. It crops out at sea, we do not know exactly where it is, but it was tapped and proven to be of old No. 6 colliery. And the Harbor Seam, which lies about 450 feet below the Hub Seam, is worked at Sydney Mines at the Blockhouse. So it is continuous over a larger area than any other seam except the Hub. It is also the only seam that goes under Sydney Harbor without either disappearing or splitting up or becoming unrecognizable as a seam. It runs in ~~under~~ the Harbor and is worked in No. 12 and Florence.

Then the Phalen Seam is without any question the Sawroo Seam and it splits up under the harbor and its identity is unknown on the north side of the harbor.

And the Emery Seam has a still smaller lateral extent. It is known in the Glace Bay area, and is not known





beyond Dominion No. 1-B.

Then the Gardiner is a little bed of coal which has a still smaller extent, and is the lowest so far as we know of the workable seams in the Sydney coal field.

There is a seam known as the Mullins, of which really very little is known.

The point that is important in regard to production is that while there is 37 miles of frontage, there is only 20 miles of that which gives access to the coal seams, and only a much smaller amount, not more than 12 miles, which gives access to all of the coal seams, because the coal seams disappear as we go West.

BY COMMISSIONER MORRISON - Is your Phalen a fairly regular seam?

A. They are all regular but when they come to a certain point they thin out, split up. The coal field was apparently laid down in such a fashion that the central part is good coal and on the edges it thinned out and failed too soon. On the frontage here the collieries that are operating on the Harbor seam are Florence and Princess and No. 12. That is all on the Harbor seam. There is a mine out of No. 2 that we call No. 20, and another one out of 1-B that we call 26. We mine the Harbor seam in both of these places.

Q. They are both in No. 2 area, are they not?

A. Yes. It is hard to show them here. Then the Phalen is the Lingan at Waterford worked by No. 6, 1-B, and 2 and 4. Although no operations on it at the present except the Garrow.

That is an illustration on shore collieries-worked in the city area.

BY MR. FRAWLEY - Dr. Gray, there is a colliery I am told that is still working but not listed, No. 11?

A. Those are just submarine collieries.

Q. No. 11 is not submarine, and that is why it is not listed on that list?

A. That is right.



SYDNEY COALFIELD  
SHORE COLLIERIES WORKING THE SUBMARINE AREA.

COLLIERY	Daily Output Capacity with full force of men in 1944 (Long Tons)	Working undormentioned seams
Florence	1,100	Harbor (Sydney Main).
Princess	2,000	Harbor (Sydney Main).
Dom. No. 12	3,200	Harbor (Victoria)
Dom. No. 16	2,600	Phalon (Lingan)
Dom. Nos. 1-b and 26	3,000	Phalon and Harbor
Dom. Nos. 2 and 20	3,000	Phalon and Harbor
Dom. No. 4	2,300	Phalon
Dominion No. 24	1,000	Emery
10 Collieries	18,200	Working on three seams under the sea.

It is considered by the Company's engineers that there is room for another colliery at a future date, not yet determined, to work submarine coal, but when the area reserved for this colliery is developed, it will be to replace declining production in other submarine collieries, maintaining but not increasing general output capacity.

Reference to the chronological statement previously mentioned will show that in fifty years of production of coal from Sydney Coalfield the Dominion Coal Company has opened and equipped eighteen new collieries, and, because of exhaustion of mineable coal, has closed and abandoned fifteen collieries. Out of the eighteen new collieries opened nine have been closed.

Nevertheless, over the fifty years reviewed, the Company has maintained a consistently even annual capacity for coal production. It plans to continue this proper and prudent policy into the future as far as it is able.

There is a condition of the coalfield originating in the manner it was laid down in the earth which should be noted. This condition has decided the workable life of some mines and will continue to do so.

The lowest situated coal-seam in the coalfield underlies the smallest area. Each overlying seam, in succession, is of larger extent, and the highest-situated seam covers the largest area of all.



Also the upper seams are of greater thickness and of better quality than the lower seams, that is the Hub and Harbor and Phalen.

These over-riding conditions have been revealed by long-continued mining operations and were not known in the earlier days of coal-mining. Their existence explains the relatively short life of mines working the lower seams, more especially the Emery seam. None of the lower seams extend in any important manner under the sea. The coal seams diminish in number and individual thickness as they go westwards from the central Glace Bay area in the direction of Point Aconi.

The conditions under which the seams were formed holds out great promise of long life for the upper seams.

It should be noted that the highest situated seam known to exist as a workable seam, namely Hub seam, has the largest extent of any seam in the field. This seam is a very valuable reserve of coal for future generations, as it has been less worked than any of the other seams.

In the centre of the coalfield there are three under-sea seams of good quality, in ascending order: Phalen, Harbor and Hub seams. It has become evident that passageways for air currents, for movement of men and coal, and for introduction of power and materials required in mining, cannot be maintained in all three seams when the working faces are - as is now the case - from two to approaching four miles from shore. It has therefore been found necessary to connect the seams by tunnels and to bring the coal extracted from two seams (later it will be three seams) to one common outlet, by joining up the workings of adjacent mines so as to have one set of main surface-openings where two were formerly required. The result of this re-arrangement of workings is a reduction in the number of colliery establishments with an increase in the production of each mine; that is, fewer mines each with greater outputs.





In the Waterford area two separate collieries operating the Phalen seam and two separate collieries mining the Harbor Seam have been re-arranged into one colliery on each seam. In other words Number 16 colliery was formerly No. 15, and No. 12 was No. 14. Now they consist of one colliery. The present daily output capacity of these two collieries is 5,800 long tons which compares with a total of 4,600 long tons from four collieries before the consolidation.

In the Glace Bay area, Mines Nos. 1-B, 2 and 4 worked an area of submarine Phalen-seam coal in three strips lying side by side. Workings in the lower (Phalen) seam have been re-arranged into two strips divided between collieries No. 10-B and 4. Under this planned re-arrangement No. 2 colliery has been connected by a tunnel with the Upper(Harbor)seam and its future operations will be on that seam. A similar tunnel has been driven from No. 1-B colliery Phalen workings to the Harbor seam above.

The result of this rearrangement of working territory and the winning of the Upper seam by tunnels, when fully carried out, will be that the Phalen seam will be served by two sets of haulage and ventilation roadways instead of three sets formerly used, and in addition the production of the Harbor seam will be raised from all three mines, thus lengthening the useful life of the hoisting shafts and surface establishments and giving them added duty without great additional expense.

The output of the three collieries before this consolidation and new winnings was 9,000 long tons per day. The capacity of these mines is now about the same and will rise to 10,000 long tons per day.

Mining in the Sydney Coalfield has therefore progressed from working the land coal at shallow depths to working of the sea coal at increasing depth immediately fringing the shore line where pillars to support the roof had to be left and seaward advance was very rapid because of the small percentage



of the seam extracted. Now a stage has been reached for working at greater depths where all the coal is removed, and seaward advance will be relatively slower so that the existing collieries have a very long life before them at about present rates of production.

At a later stage planning will be required for winning the remotely situated seacoal, the essence of which will be the still further development of the present trend towards fewer shore collieries equipped and designed for large individual production.

It will seem therefore that the closing of old collieries that have served their purpose and the provision of new collieries to meet new conditions is a natural and continuing process. It is at the same time a process of continuing expenditures to maintain production capacity, and of long-range careful planning to utilize a large but wasting resource to the best advantage over the longest period of time.

(Page 63 follows)





DR. GRAY: This sort of summary presentation of the Sydney coal will be supplemented by submissions by Mr. McColl in a more strictly mining-engineer manner.

MR. FRAWLEY: Will Mr. McColl deal with the matter of the increasing cost as you get further and further away in submarine mining?

DR. GRAY: Yes.

MR. FRAWLEY: There will come a time when you can't go any further even if there is lots of coal left?

DR. GRAY: Oh yes, I suppose there will.

COMMISSIONER McLAURIN: When you say a field has a production of  $5\frac{1}{2}$  million tons you are talking of economic production, assuming conditions remain more or less stationary as they are now?

DR. GRAY: There is a paper in the back of your copies that covers that fairly fully. Now we come to Cumberland, the Springhill collieries. These mines came under the management of the Dominion Coal Company in 1910. Accompanying is a statement of annual coal production from 1911 to 1941, over which period of 31 years there has been maintained a remarkably consistent annual production of coal around 460,000 long tons.

MR. FRAWLEY: Something else has been called to my attention, that Dominion No. 24 is not a submarine operation and still it is listed on page 28.

DR. GRAY: Oh yes, No. 24 is a submarine operation. Continuing with Springhill, Production capacity at this time is close upon 700,000 tons per year. The actual output is less than capacity because of enlistments and absenteeism.

Five workable seams are known in the Company's leaseholdings at Springhill Mines, all of which have at some time been mined by the Dominion Coal Company or its predecessors. At this time three of these seams are being mined, namely Number One, Two and Seven seams. Number Three and Number Six seams will be brought into production when required for maintenance of output.



The Springhill seams outcrop to the surface along a distance of four miles and dip at a gradient ranging from 30 to 20 degrees under younger rocks. Nothing can therefore be learned of the maximum workable extent of the coal seams, but by actual working of the seams underground and by borings. Borings are expensive because of the great depth of cover over the coal-seams and they yield uncertain data because of the disturbed condition of much of the ground that lies outside actual working areas.

Number Two Seam, which is 9 feet thick of excellent quality coal, has been most extensively worked. The face of the Main Slope is now 16,000 feet from the Slope Mouth at the surface, where the seam lies under 3,800 feet of vertical overburden reaching to the surface. The seam is still continuing downhill at a gradient of 12 degrees and borings which have been drilled ahead in the line of the Slope indicate persistence of dip of the measures containing the coal-seams. Recently the dip of the seam at the face of the Main Deeps has tended to lessen. It may be assumed that the seam persists to a depth greater than mining will be possible. What this depth may be will be determined by trial.

Sufficient physical data has been gathered by the Company's engineers to show that reserves of workable coal are tributary to the present Main Slope and Bankhead to last at present production rate for forty years to come. The major expenditures made by the Company--elsewhere mentioned in detail--and those still in prospect, are based on this minimum expectation.

As stated, the nature of the Springhill coal-fields, buried at great depth and revealed only by a short stretch of surface outcroppings, is such that the coal content of the field can only be disclosed by actual workings. It may be anticipated that such future workings during the forty years of confidently anticipated operation previously mentioned will prove extensions of the five workable seams mentioned sufficient in area to prolong the working life of the coalfield still further.



MR. FRAWLEY: In your second paragraph you speak about opening up No. 3 and 6 seams when required for maintenance of output. I am told that sometimes you open up new seams to average costs and keep down costs, is that so?

DR. GRAY: Oh yes, naturally.

MR. FRAWLEY: You have no problem of climbing costs in Springhill?

DR. GRAY: Oh yes, we have.

MR. FRAWLEY: Then I wonder whether your view is you will only bring in the new seams to increase output, or to average costs?

DR. GRAY: Oh yes, both will have to be taken into account. Now we come to the Pictou Coalfield, the Acadia Coal Company. The productive portion of the Pictou Coalfield is of small extent, totally comprised as it is within an area eleven miles long by  $2\frac{1}{2}$  miles wide. It has a remarkably complicated structure. The coal seams are numerous and very thick, disturbed by many faults, very gaseous, and associated with carbonaceous shales and oil-shales.

Coal-mining has gone on since 1800 and many mine explosions and mine fires mark its history. (A "Synopsis of Mining History" which covers this is contained in a recent Report on the Pictou Coalfield by Dr. W. A. Bell, published by the Geological Survey.)

There have been at least three separate geological eras of coal formation in Pictou County. Each formation was partly removed by erosion, and disturbed by earth movements before the succeeding formation was laid down. Later, earth movements disturbed all three coal-bearing strata series, these disturbances being followed by further erosion.

Brief and simple description of the coalfield is difficult, and no precise calculation is possible of coal reserves. Exploration consists of day-to-day mining, assisted as far as is feasible by prospecting diamond-drilling, of which very great use has been made by the Acadia Coal Company. It has, since the





present operators took over the Acadia leases, been their constant task to enlarge the knowledge of the coalfield and to combat by careful planning of methods of extraction the dangers of spontaneous combustion that the Pictou seams are liable to. To the careful technical supervision the present operators have exercised, and their skilful conservation of the remaining resources of coal is to be attributed the creditable maintenance of production capacity (1941 output was the largest in thirteen years) in spite of the notoriously difficult character of the coalfield.

Earlier mining operations carried out throughout nearly 150 years in a coalfield of such small dimensions has naturally depleted the coal deposit of the most easily accessible coal and that of best quality.

Only two known unworked reserves containing any large tonnage of coal remain in the field, one on the Acadia Seam in the Westville area and one in the Thorburn area on the McBean Seam. Both these unworked blocks lie at considerable depth, and because of mining operations carried on at a very early date in the mining history of the field, are now difficult of access. This is apart from known but unworked seams in the Albion basin which may be worked at some future date, if the strata pressures permit this.

Successful recovery is now being made of old workings in the Foord Seam by way of the Allan Shaft. These old Foord workings were lost in 1882 by explosion and fire and subsequent flooding.

It is hoped that these recovery operations will prolong the life of the Allan Shaft Mine by providing working places as needed by the exhaustion of working places in the Allan Shaft territory proper.

BY THE CHAIRMAN: Before leaving that, the McBean Seam was apparently worked before. From where was it worked, what opening?

DR. GRAY: I don't know the name of the opening; Mr.



Gordon night.

MR. GORDON: From an opening on the outcrop itself.

DR. GRAY: I might say that Mr. Gordon will supplement this. It should, however, be noted that the life of these collieries is not dependent on ordinary mine-planning, nor upon known extent of reserves (with reservation of the possibilities of the McBean seam) or upon any deliberate plan of new expenditures, but rather upon what the advance of workings in a tentative manner into unknown or previously worked-over territory may disclose of the persistence of the seams, fault interruptions, quality of the coal and the tendency of the seams to spontaneous combustion.

The whole question of the future of the Stellarton collieries is over-ridden by the future cost of production. At this time the Acadia operation is unremunerative. The following statement shows the output of the Acadia collieries over 34 years ending 1944. Production has declined from the high levels of 1926-30 through depletion of reserves, but the current rate of production is reduced by shortage of miners.

I might say that the 1944 estimate is very much understated. It actually was 315,000 tons instead of the estimated 260,000 tons.

MR. FRAWLEY: That drop from 489,000 tons in 1930 to 406,000 in 1940, that is a case of depletion of reserves?

DR. GRAY: Well, depletion of reserves and occasional stoppages by fires and spontaneous combustion and other accompaniments of mining in that field. Now I have not dealt with the Scotia collieries separately because they are included in the Sydney coalfield and in the general description of the Sydney coalfield.

MR. FRAWLEY: Just for the record, you refer to the Florence Colliery and Princess Colliery?

DR. GRAY: Yes. Now, production and distribution of coal in Canada and the part that the Steel Corporation mines play in that, with more particular reference to distribution.





The Sydney Coalfield. As concerns the Central Canadian markets served by water transportation, this coalfield is the really important source of supply. Reference has already been made to the advantageous situation of Sydney Harbour at the mouth of the Gulf of St. Lawrence . In this situation, combined with the production possibilities of the Sydney Coalfield, lay the germ of the original enterprise of the Dominion Coal Company in 1893, which envisioned the Sydney coal-seams as a permanent source of supply to the cities and industries then growing up along the St. Lawrence Valley and Montreal in particular.

Development of the Montreal coal-market is an important part of the maritime history of Canada. In development of the St. Lawrence River as the main commercial seaway of Canada the coal-carrying enterprise of the Dominion Coal Company since 1893 has played a pioneering and prominent part.

Following the incorporation of the Company in 1893, coal-loading piers were constructed on the conveniently situated harbors of Sydney and Louisburg. Railway connection and commodious colliery yards and sidings were provided, linking the mines with these shipping points, and assuring both summer and winter handling of cargo vessels and ships taking bunker coals.

The Dominion Coal Company had previously established water-front coal-discharging and handling facilities in Halifax, N.S., and St. John, N.B., with an agency in Boston, Mass., but it now proceeded to provide coal-discharging and storage docks at Quebec, Three Rivers, Hochelaga and Montreal and to acquire a coal-freighting fleet. The annual growth in the Dominion Coal Company's production was made possible by the St. Lawrence water-borne shipments. The following table will make this clear:



Period	Proportions of water-shipments to St. Lawrence ports to total annual coal production.		
1914 and previously .....	42	percent	
1915 to 1921.....	14	"	
1922 to 1924.....	40	"	
1926 to 1939.....	54	"	
Minimum year 1918.....	1½	"	
Maximum year 1932.....	65	"	
			(including rail)
1940.....	43	"	55%
1941.....	30	"	37%
1942.....	18	"	28%
1943.....	7	"	14%
1944.....	6 3/4	"	8%

These figures indicate that the normal peacetime water-borne St. Lawrence coal deliveries provide over 50 percent of the sales outlet of the Dominion Coal Company's Cape Breton collieries. This includes shipments from the Old Sydney Collieries, which also ship from Sydney Harbor on the north side.

MR. FRAWLEY: Do you say there were no rail shipments before 1940?

DR. GRAY: Very few. There is a table in here which will show exactly those figures; I will come to that later.

MR. FRAWLEY: I mean if that were so, 54 per cent of your business in 1939 was going by the St. Lawrence and subventions had been in but you say there were no rail shipments?

DR. GRAY: If you refer to Table VI you will find a complete statement there showing water and rail shipments to the St. Lawrence market from 1913 to 1943 inclusive and you will see that rail shipments came in in 1929, 59,000 tons, relatively small quantities per year until 1940 when they jumped to 547,000 tons by rail, and a similar thing occurs at the Old Sydney collieries. The rail shipments that went were mostly in the winter and in supplementation of water shipments. Sometimes it was difficult to get the entire quantity of coal up



the St. Lawrence during navigation and we carried it in the winter months.

MR. FRAWLEY: But in 1940 it went up very much because the Point-du-Chene operation came in?

MR. FORSYTH: That started in 1942.

DR. GRAY: No, that is the result of the shutting of the St. Lawrence to navigation because of the war hazard.

For 1932, the nadir of the trade depression, the Dominion Coal Company's production was only 2,027,000 tons (equivalent to less than half output). Without the St. Lawrence shipments of 1,375,000 tons (including railborne coal) the industry could not have been continued.

The transportation conditions of the Old Sydney Collieries are identical with those of the Cape Breton collieries, except that these collieries supply the Newfoundland domestic trade with house-coal in the autumn and early winter months.

The special transportation conditions of the Springhill and Acadia collieries are later described.

Table VI shows the water and rail shipments to St. Lawrence points for the four colliery units of the Corporation, from 1913 to 1943.

#### DOMINION COAL COMPANY--SPRINGHILL COLLIERIES

The geographical position of these collieries is advantageous for distribution. They are situated on the main eastern line of the Canadian National Railway, which is itself the largest single customer of the mines. Also these mines are nearer than any other Canadian coalfield to the populated areas of the St. Lawrence lowlands and to the cities of Quebec and Montreal. See Table VI for rail shipments to St. Lawrence destinations in recent years.

These mines possess, because of their situation, a local market of greater dependability and sufficiency than any other Nova Scotia coalfield. The coal reserves are sufficient to enable this market to be served for the next forty years, which is as far into the future as can be reasonably forecasted





at this time.

The Company's large expenditure on underground developments and on surface coal-preparation plants have been made accordingly.

It should be mentioned that production at the Springhill Collieries has suffered less from wartime shortage of men than the Cape Breton Collieries of the Dominion Coal Company.

COMMISSIONER MORRISON: How do you account for that, Dr. Gray?

DR. GRAY: I don't know just how to account for it except it is a fact. The men didn't leave Springhill and we have not had the same shortage of men that we have in Cape Breton.

MR. FRAWLEY: You mean producers?

DR. GRAY: Producers.

ACADIA COAL COMPANY--PICTOU COALFIELD

There is a partial local market for this Company's production, the coal being ideally suited for domestic heating and railway locomotive uses.

In the years before the war (as shown by the record of St. Lawrence shipments, Table VI), to furnish summertime employment for these mines, coal was shipped to St. Lawrence ports from the Company's coal-loading pier at Pictou Landing to augment the larger St. Lawrence water-movement from the Scotia and Dominion piers on Sydney Harbor.

If the sale of Nova Scotia coal in the St. Lawrence market returns to pre-war tonnage then it is expected shipments by water from the Acadia collieries may be necessary to give summer employment to these mines.

Now we come to subventions and transportation generally. "The Effect of Transportation Costs on the Sale of Nova Scotia Coal in the Central Canadian Market." The markets open to Nova Scotia coal are now confined to Eastern Canada and Newfoundland.



While the New England market was formerly open to Nova Scotia coal it now has only an historical interest. The countervailing duty proviso on coal imported from Canada into the United States was removed from the coal item of the United States Tariff in 1934, in recognition of the fact that coal mined in the United States can be delivered in Boston and other New England ports more cheaply than Nova Scotia coal. The integration of coal-mining, coal-freighting and coal consumption by large gas and electric public utilities in the New England cities is complete. It is not this fact, however, but the cheaper delivered-cost of coal of United States origin when compared with any possible foreign source of supply, (Nova Scotia included) that makes New England no longer a possibility as an outlet for Nova Scotia coal. The fact is fully known and accepted in the coal trade, and is only mentioned here to preclude unnecessary discussion.

Newfoundland, by reason of its nearness to the Sydney Coalfield, may be considered part of the Maritime coal-consuming territory within which transportation costs are a minor consideration, in ordinary times. They are not a minor consideration today, unfortunately.

In the other markets for Nova Scotia coal, however, transportation costs are a major consideration.

For good reasons, elsewhere explained, and necessary to be accepted as an unalterable fact, the mine-mouth cost of producing coal in Nova Scotia is greater than in the United States. But up to a St. Lawrence port of discharge, Quebec City, Three Rivers and Montreal, it has been possible to balance the delivered cost of Nova Scotia coal by a cost of freighting much less than the cost of rail and water transportation of coal from United States mines, plus the protective duty on U.S. coal. This margin of advantage to Nova Scotia coal has always been a very small one, and during two war periods, 1914-1920, and the unknown duration of the war that began in 1939, this water-borne traffic has become impracticable because of shortage of ships.





Leaving these wartime disturbances on one side, and looking forward to return of the lower water-freighting costs on which the Nova Scotia-St. Lawrence coal-movement is founded--which of course is a considerable assumption--it may be expected that in the future as in the past the effective limit of the competitive ability of Nova Scotia coal against imported United States coal will end at the St. Lawrence port of discharge from steamer.

MR. FRAWLEY: Even that might be affected by the St. Lawrence Seaway.

DR. GRAY: It might. It will be a double-bitted axe; it will work both ways. Inland furtherance of the coal by rail, or by Lake steamer, will require--as it did before the War--the assistance of Federal transportation subventions to meet the competition of imported U.S. coal. Also, the greater the distance of inland furtherance the greater the transportation assistance required. Moreover, as Nova Scotia coal moves further westward from a St. Lawrence port it meets the competition of U.S. coal on an increasing scale because the distance U.S. coal travels from its mine of origin progressively lessens.

Because of recurrent crises in Canadian coal supply, threatening national security, it became evident that if the Nova Scotia collieries were to be depended upon to give Eastern Canada an even partial independence of imported coal, it was necessary to assure the Nova Scotia mines of a consistently even rate of coal production. It was realized that if in times of fuel abundance the Canadian coal supply was imported from the United States while the Nova Scotia mines were only partially operated, then in times of fuel scarcity no dependence on our native mines was possible, or to be expected.

The situation was examined in 1921 by a Special Committee of the House of Commons and again by a Special Committee of the Senate in 1923.

Out of the deliberations of these Committees came the formation of the Dominion Fuel Board and a policy of transportation subventions designed to widen the territory in which Cana-



dian-mined coal is used and thereby to increase Canadian coal production.

The first subvention (under P.C. 1537) was considered by the Federal Government as a "trial movement". The Order-in-Council was passed late in the year 1924. There was little opportunity to take advantage of it and it expired at March 31, 1925, after having assisted to move 42,000 tons at a cost of \$11,051.00 to the Federal Treasury.

By an Order-in-Council of February 13th, 1926, the Railway Board was instructed "to enquire into and report on cost of transportation on rail movement of Maritime coal, in full train-lots to Quebec and Ontario," and in March 1928, as a result of the Board's Report, an Order P.C. 539 was passed for the purpose of assisting the Railway Board into its authorized enquiry into costs, as shown by test movements of Maritime coals, by reductions in freight rates to points in Ontario and Quebec.

The rail-rate on coal from the mines to Montreal was reduced from \$4.50 per net ton to \$3.00, as an arbitrary temporary rate for the purposes of this test-movement. The Railway Board awarded \$1.95 per ton to the Railways as the amount to be paid over and above this \$3.00 maximum.

MR. FRAWLEY: I don't quite understand that. What was the subvention, \$1.95?

DR. GRAY: That was not the subvention; that was the amount which the Railway Board awarded over the \$3.00 which they considered to be the cost of moving that coal.

COMMISSIONER MORRISON: In other words the railways received 45 cents a ton extra for moving coal. Was that the extra?

DR. GRAY: Yes, they got 45 cents more than their scheduled rate.

MR. FRAWLEY: Any contribution from the Federal Treasury?

DR. GRAY: Not at that time. That was taken out of monies that had been provided elsewhere.

For coal sent to a St. Lawrence port by water from Nova Scotia a forwarding subvention to points in Ontario was



provided of one-fifth cent per ton-mile.

This was the beginning of a Federal policy intended to overcome the handicap of distance of the coal-mines from the large coal-consuming centres of Canadian population.

Under the 1928 orders Nova Scotia coal was assisted by subventions as follows:

	Tons of Coal Moved	Cost to Treasury
1928.....	114,008	\$ 65,759
1929.....	304,533	205,466
1930.....	372,056	214,003
	<hr/>	<hr/>
	790,597	\$485,228

In 1931 the Federal Cabinet announced that as the test movement had demonstrated that Nova Scotia coal could, with limited assistance secure considerable markets in Quebec and Ontario "where under existing freight-rates Nova Scotia coal was at a disadvantage in competing with United States coal," it was continuing and enlarging the subvention assistance. By P.C. 1300 (May 1931) water-borne coal ex St. Lawrence ports forwarded by rail to Quebec points was given assistance of one-fifth cent per ton-mile--with a limit of 75 cents per ton--and to Ontario points, one-third cent per ton-mile, with a limit of one dollar per ton.

In 1932, in addition to these provisions, the subvention was enlarged to include railway coal--previously specifically excluded--by an amount equal to the difference in the laid-down cost of imported coal and Maritime Provinces coal up to a maximum of \$2.00 per net ton. The maximum was increased to \$2.50 per ton in 1933.

Between this date and the outbreak of war in 1939, the policy of subventions in reduction of freight charges on coal carriage has been maintained. It has been administered by the Dominion Fuel Board, and modified in detail to meet changing conditions of production and cost of carriage.





BY THE CHAIRMAN: That was mostly over the C.N.R.?

DR. GRAY: I think altogether.

BY THE CHAIRMAN: I would like sometime if we would get some absolutely clear picture of that.

DR. GRAY: Yes, Mr. MacLenders will be giving you very full detail on that.

MR. FRAWLEY: The Western subventions were granted at that time?

DR. GRAY: Oh yes.

MR. FRAWLEY: And the C.P.R. shared in it at that time in the Western Provinces?

DR. GRAY: Oh yes, I think they did.

BY THE CHAIRMAN: In the case of the Canadian National it does seem to me that the Government was taking it out of one pocket and putting it into another. You hear a lot against subventions, you know, that they are costing the people of this country a tremendous lot. As far as the C.N.R. is concerned I think it is costing the taxpayers very little, because if the C.N.R. were not getting that extra money for carrying coal we would be paying much more on the great bonded indebtedness of the C.N.R.

DR. GRAY: The Dominion Fuel Board has the right of access to all sources of information necessary for administrative purposes. The sums provided by the Federal Treasury in reduction of freight charges applying to the delivered cost of coal are paid to the railways. Full knowledge of such amounts is in possession of the Dominion Fuel Board. The coal-producing companies have no knowledge of these transactions further than the "acceptance" by the Fuel Board of a delivered cost of coal at a specified point, where, without the aid of the freight subvention, they would be unable to meet the price at which imported coal is sold there.

MR. FRAWLEY: That interests me, this expression "acceptance" by the Fuel Board. Do they go into your office here and look at your costs?



DR. GRAY: They do.

MR. FRAWLEY: They have the right to question them?

DR. GRAY: Yes.

MR. FRAWLEY: If they thought those costs were out of line they would have the right to withhold subvention aid?

MR. MACLANDERS: Perhaps I can answer that question. Suppose you were about to sell 12,000 tons of coal. You would apply for an "acceptance" to the Fuel Board. They would figure out the laid-down cost of the American coal at the point. They would then take our cost and the freight and delivery expenses and give us the difference.

COMMISSIONER MORRISON: Who determines the cost?

MR. MACLANDERS: The Fuel Board, the secretary of the Fuel Board.

MR. FRAWLEY: When you say "they take our costs" do they literally take what your company says is the cost or do they come down here and investigate?

MR. MACLANDERS: Oh no, they are continually examining the figures.

DR. GRAY: I might perhaps refer to page 117, which is in the submission to the Dawson Commission. We don't propose unless it is desired to read that submission but there is a reference there to transportation of coal which I think should be noted.

"When subventions on coal carriage by rail were first granted in 1924 the Order-in-Council stipulated that such assistance was to apply only when accompanied by reductions made by the railways in the schedule freight-rates.

"We urged in our 1934 submission an orderly and thorough re-examination of the freight-rate schedules as it affects coal and steel, as was recommended by the Duncan Commission on Maritime Claims in 1926. We observed that, in our opinion, insufficient study had--up to 1934--been given to the possibilities of rail movement of coal and steel in large quantities from





Nova Scotia to Upper Canadian destinations. We also submitted the subventions would fail of their maximum usefulness in assisting the sale of Canadian-mined coal (and steel) in Canada 'if they are employed to lessen freight-rates that may be in themselves unnecessarily high'."

BY THE CHAIRMAN: Did the Report of the Duncan Commission help out the Maritimes on freight rates?

DR. GRAY: Yes, it did; very much so.

MR. FRAWLEY: I think it resulted in the passing of the Maritime Freight Act, which immediately reduced all freights out of this country by 20 per cent.

DR. GRAY: Now the Water and Rail Movement of coal to St. Lawrence and Central Canadian destinations are compared.

Reference to Table VI will show that only water-carriage of coal was attempted from the Cape Breton and Pictou County colliery groups until, in 1928, the schedule railway freight-rate was lessened by granting of a subvention on coal moved to Montreal and the surrounding area. There had been increasing difficulty in delivering the large tonnage of coal necessary to meet sales demands, within the limits of the navigation period. The season opens about May 15th and ends about the first week in November, in respect to despatchings from Sydney Harbor--a period sometimes much shortened by late drift ice in the spring and early onset of winter in the autumn.

For example in 1927, the St. Lawrence water-borne quantity was 2,415,140 gross tons (2,705,000 short tons) without the additional market later opened up in Ontario by subventions aid to long-distance inland carriage of waterborne coal discharged at St. Lawrence ports. In 1934, total coal sales in Quebec and Ontario, transported by water and rail, or a combination of both methods, had risen to 2,852,536 gross tons (3,200,000 short tons) as shown by Table VI.

By 1939 this figure had increased to 3,036,479 long tons (3,419,000 short tons).

In this year (1939) the sales of Dominion Scotia coal



in the St. Lawrence area and its continuation into Ontario were distributed as follows:

	Short Tons
Province of Quebec .....	2,215,807
Province of Ontario.....	834,054
Canadian National Rly. in Ontario	<u>430,366</u>
	3,480,227

This figure of almost  $3\frac{1}{2}$  million net tons does not at all represent the available market in the region.

Actual sales in Quebec Province in 1940 were 2,730,830 net tons, and in the Ontario region the market is only limited by the ability of Nova Scotia mines to produce coal, and water and rail transportation ability to carry it to Ontario destinations at a delivered price, competitive with coal imported from the United States.

The 1939 and 1940 shipments to St. Lawrence and Ontario points were made in the following manner:

	(Short Tons)	
	1939	1940
By Water.....	3,267,208	2,373,158
By Rail.....	<u>134,648</u>	<u>798,661</u>
Total	3,401,856	3,171,819

The decrease in overall shipments in 1940 from 1939 is the result of lowered production caused by loss of men to the armed services at the mines. The decrease in the proportion of water-borne coal and the large increase in rail-borne coal is the result of the shortage of ships and increased maritime risks consequent upon war conditions. As bearing upon post-war transportation practice there can no longer remain any question of the ability of the railways to carry coal from the mines to Central Canada.

Large as is the tonnage of coal that was carried by the railways in 1940 when compared with previous standards, it can be assumed that a larger tonnage could have been carried, had not the railways been pressed by unusually large wartime traffic,



It has been shown elsewhere in this memorandum that not less than one million tons and up to  $1\frac{1}{2}$  million tons of unused output capacity is available at the mines of the Corporation. This tonnage, if added to the actually achieved shipments of 1939, would make possible sales in Central Canada from the Corporation's mines of from 4 to  $4\frac{1}{2}$  million short tons per year, carried by combined water and rail methods of transport.

While water transportation must and should always be looked upon as the principal mode of carriage, it is plain that it must be supplemented by rail carriage if the all-year operation of the mines is to be achieved.

A continuous maximum use of coal-producing capacity and of uninterrupted coal-movement to distant markets to enable Nova Scotia collieries to pull their full weight in relief of Eastern Canada's (Ontario and Quebec) deficiency of native coal supplies.

The closure of St. Lawrence navigation by ice conditions has from the beginnings of the Nova Scotia coal-trade been detrimental to the full utilization of the coal-production ability of the mines. The erection of the Sydney Steel Plant in 1900 and its subsequent operation has, as was intended, assisted more than any other factor, in evening out the seasonal disproportion in the coal outlet. The banking of coal in the winter months has been another practice undertaken to give greater winter employment, and since subventions have been provided and winter rail-movements thereby made possible, further relief has been given in the winter operations.

Over the period 1927 to 1942, fifteen years, an average quantity of 600,000 long tons was stored in winter banks at the Dominion Coal Company's Cape Breton collieries and those of Old Sydney collieries. That is, at these Cape Breton mines it was necessary to store this annual tonnage in the winter as part of the St. Lawrence water-movement in the summer. Table IX gives the details.

Rail delivery of coal to customer's yards in winter in





the St. Lawrence area has advantages in that it relieves the Corporation and the customer of the necessity to put down summer stockpiles at the receiving end, and makes it possible to deliver coal to the customer with minimum deterioration and breakage. This is especially helpful in competition with rail-borne coal coming direct in car-lots from United States mines, and particularly advantageous in respect to slack coal delivered to customers using powdered coal combustion equipment. It is difficult and more costly to pass wet and frozen coal through the pulverizers, and for this purpose dry coal coming direct from the mines has a commercial advantage over coal taken from stockpiles mined months previously to usage.

Such areas as the Eastern Townships are also as economically served by coal shipped direct from the mines in railway cars as by coal sent to Montreal by water, there discharged onto dock, and subsequently loaded from stockpile into cars for forwarding to destinations east of Montreal.

4.00 P.M. - COMMISSION  
ADJOURNED



WEDNESDAY, JANUARY 17, 1945.

The Commission resumed its hearings at the Court House, Sydney, N.S., at 10.00 A.M.

Dr. Gray continued with his submission of the brief S/1.

We come now to the question of Mechanization. That treats of the possibility of increasing individual production and of lessening the per-ton cost of coal production by the greater use of mechanical aids.

The Dominion Coal Company has led coal-mining practice in Canada in respect to what is loosely termed "mechanisation" of the process of the mining of coal at the working faces. Some definition of this term is required as applied to the actual practice. Upon critical examination it will be found to resolve itself in the Corporation's mines into a question of the extent to which manual loading of coal can be superseded by the employment of loading machines after the coal has been loosened and broken down at the coal face.

Except in occasional conditions where hand-pick mining must be resorted to, all the coal mined in the mines of the Corporation is machine-cut. On longwall faces approved types of longwall cutting-machines of chain-cutter type are employed. In pillar and room workings percussive cutting-machines predominate at the present time, but in two mines short-wall electrically-driven cutting-machines are used.

In longwall faces, the coal loosened from the solid seam by undercutting and blasting, is loaded by hand on to moving conveyors running the length of the face. These face-conveyors, where conditions permit, discharge into level-conveyors which transport the coal to a loading-head, where the coal is discharged into mine-cars on a rope-haulage.

In room and pillar workings the coal is loaded by hand into mine-cars and is taken by horse haulage to the rope-haulage road.



1911

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There are two possible methods of mining. One method achieves total extraction of the coal-seam at one operation by use of the longwall method, resulting in a subsidence of the surface--or in the case of submarine collieries it would be the ocean floor--corresponding in extent with the thickness of the coal-seam extracted. The other method is "pillar and room" leaving pillars to support the roof. The choice between methods, in submarine workings is decided by the depth of cover lying between the coal-seam and the sea-bottom. Longwall is not permissible under the Mining Act until a stated depth of cover is reached. Once the specified cover has been obtained, the extent to which manual loading of coal in longwall faces can be assisted by mechanical conveyors depends on whether the conditions of the roof and floor and the inclination of the seam will permit this.

BY COMMISSIONER MORRISON: On that point, what is that specified cover?

A It varies according to the conditions. Mr. McColl will give you full data on that. The conditions therefore--and not the free choice of extraction methods--decide the extent of mechanisation that can be adopted at the coal working-face.

The Company's mining engineers have given much earnest consideration to the possible use of face loading machines, extensively employed with success in coal-mines in the United States. It is very fully realized that the relatively high cost of coal-production in the Nova Scotia mines--when compared with mines in the United States--is a consequence of the low individual miner production in Nova Scotia mines. There are many reasons why coal-mines now operating in the United States are favored as to individual rate of coal production. These reasons include level seams, lying under shallow cover, with strong roofs; absence of gaseous conditions; grades favoring easy and cheap run-off of mine water; thick, clean seams, short travel distances underground and ease in ventilating. All such



operating conditions are much more onerous in Nova Scotia, but, directing attention solely to the possibility of the use of coal-loading machines at the face, which admittedly help greatly to achieve the high individual rate of coal production in the United States, it will be found that the existence of strong roofs, of coal-seams having level and even grades allowing the free and uninterrupted movement of large-capacity machines, free from explosive gas and permitting free use of electric power, are the main conditions that make possible the extensive use of coal-loading machines in United States practice.

Conversely, the Nova Scotia coal-seams, friable in themselves, have weak roofs and weak floors, necessitating their support by timbers and steel supports. Nova Scotia coal-seams are gaseous--some of them extremely so--requiring the use of compressed air in preference to electricity as a motive power on coal faces. Also, and this is a strong deterrent to the use of coal-loading machines, the grades of the seams are too heavy for large track-mounted machines.

These considerations affect chiefly mechanisation at the coal working-faces carried further than the already considerable mechanisation achieved in all the collieries of the Corporation.

In all other respects the mechanical lay-out of the collieries of the Corporation is modern and well adapted to its purpose.

Electric power is used for coal-haulage, pumping and ventilation, underground and for all surface operations. There is no parallel in Canada, and probably not elsewhere, to the extent to which electricity is used as a motive-power for large underground haulages in the mines of the Corporation, a result of long drive into the submarine coal.

In 1913 the use of electric power by the collieries of the Dominion Coal Company was at the rate of 5 1/4 kilowatt hours per ton of coal raised. In 1943 the corresponding figure





was  $25\frac{1}{2}$  k.w. hours per ton, or five times greater per ton of coal raised than in 1913.

This increase is, in part, due to the longer underground distances that the coal has now to be hauled, but by far the greatest increase in the use of electricity has resulted from the technical improvements made in electrical devices for use in coal mines, thus permitting the enlarged use of this source of power.

Provincial regulations and the conditions of Nova Scotia coal mines, particularly in regard to gas, require a more fully-protected electrical-machine than is commonly used in the United States, and engineers of the Corporation have proceeded with necessary prudence to extend the use of electricity throughout the mine workings.

The engineers of the Corporation are keeping abreast of improvements in mechanical devices and methods of working and are more than willing to adopt them if they can see that their use would result in lessening the cost of production.

In this regard it should be stated statistics dealing with coal mining in the United States show that the increase in the use of mechanical loaders is accompanied by an almost similar increase in mechanical cleaning on the surface, of mined coal, an increase that is quite understandable, as a mechanical loader will load everything that comes in its path. Consequently, if the increase in tons per man obtained through the use of mechanical loaders does not reduce the cost of extraction sufficiently to offset the cost of mechanical cleaning of coal, including the loss of coal occasioned thereby, then it naturally follows that mechanical loading is not a paying proposition.

What it is desired to bring out in the foregoing observations is that mechanical loading is not a universal panacea and that in some cases the introduction of mechanical loading has actually increased the cost of operation.

There are no precedents for under-sea coal-mining on the scale of the operations of the Corporation in the Sydney





Coalfield except those based on local experience. The growth of technical knowledge based on such experience has been gradually translated into operating practice, a process that is continuing and must continue.

This brief reference does not attempt to cover the whole ground of mechanisation of coal-mining, which is a very large question, but we shall be glad to amplify our submission under this head as the Commission may desire, and I may state that we have engaged mining engineers from the United States who will examine our situation and report their opinion of how our mines are adapted or not adapted to further mechanisation of coal-loading, and Mr. McColl is prepared also to elaborate on the matter.

Now the concluding chapter is not so much a submission as a summarized statement of the Geological Aspects and Coal Reserves in Nova Scotia, summarized as to their value as future sources of coal production, based on their geological characteristics, and with the idea of giving the Commission references to official information. There is a tremendous amount of information available at Ottawa and Halifax.

BY THE CHAIRMAN: I suppose nobody has reached the opinion that they have unearthed all the information on this problem?

DR. GRAY: There is just one definite possibility of the existence of a concealed coal field. That is the only one I know of. It is in the Springhill Coalfield, at Halfway River.

BY THE CHAIRMAN: I remember 45 years ago that the geological folk connected with our Provincial Government thought they had complete, absolutely definite information in regard to our coal resources. Well, I think that has been knocked sky-high.

DR. GRAY: Oh well, of course nobody knows.

BY THE CHAIRMAN: I noticed that the finest seam of hard coal yet discovered in Wales was unearthed by a German bomb during the war, and they thought they had pretty well mapped out



their reserves there.

DR. GRAY: Of course the British know a good deal more about their country now because of the search for oil.

BY THE CHAIRMAN: One more question. Are you making any recommendation to the Commission as regards a further survey?

DR. GRAY: Well, not any more than it is implicit in this presentation here. I think everyone will agree we are very much indebted to the Geological Survey. From 1873 to about 1919 we had nothing in this country but the old maps that were made by the early geologists like Hugh Fletcher, and in the meantime there was almost 50 years of coal mining, coal search and discovery which required to be put on new maps, and new maps have been issued for this coalfield and for Inverness, Springhill and Pictou; good maps too.

MR. FRAWLEY: Down here is all that work done by the Geological Survey at Ottawa?

DR. GRAY: At Ottawa, yes.

MR. FRAWLEY: Do you have anybody like Dr. John Allan, from the Provincial point of view, who had made maps?

DR. GRAY: No. When Nova Scotia entered Confederation she understood that she would get that assistance from Ottawa and we have never attempted a Geological Survey of our own, but the Deputy Minister of Mines is himself a geologist, who by the way was a confrere of Dr. Allan at Alberta University, but we rely on the Ottawa geologists and they rely on us to give them the knowledge that we have.

MR. FRAWLEY: That is on the Dominion --?

DR. GRAY: On the Corporation. The following notes are intended as informed generalizations from which to deduce a long-range forecast of the trend of coal-mining in Nova Scotia.

The conclusion derived is that while the total coal output of the Province can be indefinitely prolonged at about the production of 1940, that is, between  $7\frac{1}{2}$  and 8 million short tons per annum, there will be a shift in the sources of output as indicated in the attached statement. Beginning with 1920





and continuing to 1940 the percentage of the total coal output of the Province coming from the four main producing districts has been as shown below. The indicated production percentages at the end of 1949 and as probable during a fourth decade beginning 1950, are shown in parallel column:

NOVA SCOTIA COAL PRODUCTION PERCENTAGES BY COUNTIES

Districts	(Short Tons)	
	Average of Two Decades 1920-1940	Year 1950
Cape Breton County	75%	77%
Cumberland County	12%	14%
Pictou County	11%	8%
Inverness County	<u>2%</u>	<u>1%</u>
	100%	100%

This forecast is given only as an indication of trend based on the rate of depletion of mineable reserves of coal in Inverness County, in the Joggins area of the Cumberland Coal-field, and to a lesser degree in Pictou County.

In the two other Districts, that is, in Cape Breton County and in Cumberland County, it should be possible to reach and indefinitely maintain production at a somewhat higher rate than in 1940, but in neither area will it be prudently feasible to greatly exceed this annual rate.

There is in either case no question as to the adequacy of the resource, but the manner of the coal occurrences demands that mining plans should be directed to production of an even annual tonnage spread over the working future of the coal-productive area.

GEOLOGY OF THE COALFIELDS AS BEARING ON  
COAL RESERVES

The search for coal in Nova Scotia has been combined with actual mining operations for approaching 150 years.

The technical departments now centred under the Department of Mines and Resources at Ottawa, more particularly the Geological Survey and the Fuel-testing Laboratories, have mapped

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$$x = 0, \quad y = 0, \quad z = 0$$

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the coalfields and assembled very full data on their geology, also on the chemical and physical characteristics of the coal-seams.

In the past 25 years the older map-sheets of the Geological Survey--of general date around 1875--have been revised. There are now up-to-date sheets, with accompanying Reports, on the Joggins-Springhill Coalfield, the Pictou Coalfield, the Sydney Coalfield and on the separated coalfields of Inverness County.

The age-sequence of the several fields is now established by the paleontological work of Dr. Walter A. Bell and correlations in broad outline have been established between the coal deposits of the United States and Europe. This work, while of much scientific interest, has economic bearing on coal-prospecting operations. That is a point not always realized--sometimes thought to be the work of a long-haired professor--that a scientific exploration of this kind has really very effective and beneficial economic results.

As determined by Dr. Walter Bell there have been three main eras of coal formation in Nova Scotia, viz.:

Newest Formation:

- (a) Pictou Group--including the coal-seams of Sydney, Inverness Mines, Mabou Mines and Pictou County.

Middle Formation:

- (b) Cumberland Group--including the Springhill-Joggins area.

Oldest Formation:

- (c) Riversdale Group--including Port Hood, Chimney Corner, and Richmond County, all situated in Cape Breton.

The economic significance of this arrangement of coal-bearing formations by their relative age is that the Pictou Group--the newest of the three formations--contains the largest areas of the most valuable coal-seams of the Province.

The Cumberland Group includes the second most valuable seams, those of the Springhill-Joggins area, with the possibility that a concealed coalfield may be contained to the south-west





of the Springhill Field, near Halfway River--later reference is made in this note. The Riversdale Group contains no really important coal-seams. Summary descriptions of the several coal-fields now follow, and I would refer you to the Memoir No. 238, "Carboniferous Rocks and Fossil Floras of Northern Nova Scotia" by W. A. Bell, which contains particulars of the age-sequence of the coal-bearing rocks of Nova Scotia.

#### SYDNEY COALFIELD

The productive portion of the field is roughly 35 miles wide measured along the shore frontage. It is bounded by faulting against older rocks on the north-west and south-east. The maximum inland extension of the field is seven miles from the shoreline.

While the coal-seams extend inland about seven miles at their maximum extension it is probable that when they were first laid down they went back as far at least as the Mira River and that the intervening area formerly underlaid by coal has been removed by erosion; not by the erosion of the ice age as commonly supposed but by the fact that the coal seams were laid down, so we are told, about five hundred million years ago and in the meantime nothing was ever laid down on top of them and all the frosts and snows and wind and rain of five hundred million years have acted to erode them on the edges.

The shape of the coalfield is indicated (from present knowledge) to be roughly oval, with its long axis and maximum extension of coal-seams running north-easterly under the sea.

The long axis of the coalfield runs north-easterly--south-westerly through the vicinity of Table Head, Glace Bay, where all the coal-seams occur in fullest development. The seams thin out and become unworkable proceeding westerly towards Point Aconi, the lowest seam first and the succeeding seams in ascending order, the highest seam having the widest westerly extension.

The workable coal-seams, so far as known from their land outcroppings, are all contained in the upper 2,000 feet of





the coal measures. You asked, Mr. Chairman, if there was any possibility of coal-seams unknown. There are possibilities of seams under the waters of the ocean. The Point Aconi seam is now entirely eroded, that is the top is gone, and you can walk to the tip of the island or go in a boat on the top of the coal-seam, and future generations will not know, except for the geological records, that there ever was a coal-seam there.

Now the harbor seam which I spoke about yesterday as being so continuous is only 7 inches thick at Black Rock here at the Great Bras d'Or entrance, and it increases to 4, 5 or 6 feet here and about 8 feet over here, and at the Blockhouse about 9 feet. It is just possible that one of those seams might be present under the sea as a fully-developed coal-seam and that may be determined some day by mining upwards from the topmost seam which we know, which is the Harbor. That is something for future generations to dream about.

The Sydney coal-seams are all the remains of vegetation growing on swamplands. Each succeeding area of vegetation and the coal-seam resulting therefrom seems to have been larger than the preceding one, as the growth-area widened and overflowed the surrounding country, with the result that the coal-seams, as mined today, in ascending order, each cover a larger area than the seam next below. The Sydney seams all dip gently seawards and, as a consequence of the progressive upward enlargement of the coal-seams area mentioned, the lowermost seams do not extend importantly seawards. The higher the coal seam in order of deposition the further it extends seawards.

The economic consequence of this overlap of the coal-seams are favorable to undersea mining. The lower seams which lie in submarine territory at a depth making mining difficult do not extend seaward importantly. The upper seams, at shallower depths, do extend seawards, and constitute the main reserves of the coalfield.

The dip of the coal-seams seawards is persistent to the place of the thinning out and eventual termination of the coal-



seams at a distance from shore that is unknown.

There is a popular idea that since these coal seams go upwards on land they go upwards at sea, but they do not, they continue seaward to their termination because they were originally laid down horizontally, then they were tilted and the top part was wiped off. They will never reach the end of it in the sense that it will ever turn up.

The coal under the land has been actively worked in the upper seams for many years and is now exhausted. The lower seams under the land areas, because of their smaller areal extent, are of relatively small economic importance. The great bulk of the coal reserves lie under the sea beyond the present undersea-workings, which have reached points ranging up to four miles from shore.

Stating the future of this field in summary terms, there appears to be little reason to doubt the existence of very large coal-reserves in the submarine area, sufficient indeed to require no forecast of limitations of production arising from lack of mineable coal for generations to come.

The limitations which will impose themselves, as time goes on, are those arising from distance of the working faces from the mine entrance on shore, or the depth of strata cover.

In a study directed to determining, for economic purposes, the value of the Sydney Coalfield, as a source of continuing coal supply--to which the members of the Commission are referred--the limiting factors were listed in order of their importance as being:

- (a) Ingress and Egress of Men working the Coal Face
- (b) Ventilation
- (c) Depth of the Strata Cover
- (d) Haulage
- (e) Power Transmission

There will be a limit to the extent of time that can be spent in going to work and coming back from work. I think that in the long run will prove to be the first or the least





tractable limitation. Then there is the question of ventilation and the others. All those matters will be dealt with in such detail as the Commission desire by Mr. McColl.

The authors of the paper mentioned (The Sydney Coalfield. Speculation on the Shape and Extent of its Submarine Extension and Economic Conclusions. F. W. Gray and R. Heath Gray. Trans. C.I.M. & M. Volume XLIV, 1941)--who had special facilities for their investigations--made an estimate of the Coal Reserves of the Sydney Coalfield, based on geological, operating and market data, and estimated an annual output of  $5\frac{1}{2}$  million long tons could be maintained for 180 years.

I give a reference here to the geological sheets which you can obtain. There are four sheets--359A, Bras d'Or; 360A, Sydney, West; 361A, Sydney, East; 362A, Glace Bay.

I will deal now with the Coalfields on the Western Shore of Cape Breton Island.

These fields are detached occurrences, fringing the Western shore of the Island in a straight line going from South to North in order: Port Hood area, Mabou area, Inverness area, and Chimney Corner area. All of these deposits have at some time been worked, but only the Inverness area is now being operated, as a diminishing field.

#### PORT HOOD AREA

This is three miles in length from south to north, extending inland four miles from the coast, and probably continuing under Port Hood Island. Only one workable seam is known. The coal reserve is all under the sea. The Port Hood mine was flooded from the sea in 1911, and workings outside the flooded area have since been intermittent. There is an unworked area south of the flooded area, which, with skilled supervision, could yield a small daily production for local consumption for a number of years.

The coal is of a quality suited to household uses. It is a sub-bituminous coal, with high sulphur content, which will not store in banks because of a tendency to heat.



The area is a reserve of coal, best utilised by a small daily production, for household consumption, within a restricted distribution range.

BY THE CHAIRMAN: When they undertook to cure that mine from flooding was there some report made to the Government at that time?

DR. GRAY: There was a report made by Norman MacKenzie and Alexander MacEachern and someone else to Mr. Donkin at that time. I can give you the reference to that; it was published at Halifax.

MR. FRAWLEY: That is to the Provincial Government?

DR. GRAY: To the Provincial Government, yes.

#### MABOU COALFIELD

The structure of this coalfield is not really known. Mining was carried on intermittently in the so-called Seven Foot seam until 1909 when workings driven too close to the sea-floor caused inundation.

There are indications that there may be a body of workable coal of good quality under the sea, but to prove this would be a speculative enterprise that would require large capital outlay, not justified except by market demand not to date apparent, and not possible without State aid in the prospecting stages.

The area can be classed at this time only as a potential reserve.

#### INVERNESS COALFIELD

This field is principally all submarine, the land area being confined to a strip five miles in shore frontage and  $1\frac{1}{2}$  miles in land depth. The dip of the measures seawards is very steep increasing to over 60 degrees.

The deposit is depleted of commercially mineable coal, and has for some years past been operated, as a measure of relief for the local mining population, by the Provincial Government at heavy monetary loss. The deposit must be ruled out as an important future reserve, and would not be operated as a commercial undertaking.





CHIMNEY CORNER--STE. ROSE AREA

This area has recently been examined and reported upon by Dr. Walter A. Bell of the Geological Survey. (Paper 43-14, Department of Mines & Resources, Ottawa, 1943). These areas were once continuous, but were later separated by faulting, and partially removed by erosion in the intervening area.

Economically the deposit is unimportant, the seams being variable in thickness, containing dirt bands and of poor quality. Dr. Bell estimates the coal content at 10 million long tons, with a probable submarine area, the coal content of which is estimated at 1,350,000 tons additional.

Dr. Bell places the deposit in the Riversdale Group, or in the time of the beginnings of coal deposition, when environment suitable to the growth of coal-forming vegetation has not fully developed. In this respect it seems to resemble the rudimentary coal occurrences in Richmond County, Cape Breton Island, and the "Fern Ledges" near St. John, N.B.

BY THE CHAIRMAN: All the operations have been discontinued there?

DR. GRAY: Yes, I don't think there is anything doing there at all.

PICTOU COALFIELD

This area is small, roughly 11 miles long by 3 miles wide. In relation to its original coal-content the field has been more extensively mined than any other Nova Scotian coal deposit. Commencing about 1818 and continuing actively to date, a period of 125 years, some 44 million tons of coal have been mined from this field for sale, while concurrently a much larger tonnage has been left in the ground to support the roof, or been otherwise rendered unmineable by mine fires, crushed strata and other concomitants of mining.

There are three separate coal deposits in the Pictou area. The Westville seams, first formed, were overlain by the Stellarton seams, which were in turn overlain by the Thorburn seams.





In the three areas named there are sixteen seams of variable thickness and quality. The area is faulted. The strata between the seams includes highly carbonaceous shales, and some oil-shales. The coal-seams and the strata they occur in give off much gas, and are prone to spontaneous combustion.

All these conditions, during the life of the field, have given rise to gas explosions and mine fires, and occasional loss of coal territory, especially in the earlier years of operation, when the characteristics of the field were not understood. In recent years careful and skilled supervision based on experience has moderated these troubles, but cannot eliminate them, because present conditions are partly a legacy from the earlier operations.

As a source of future coal-supply the first consideration in respect to the Pictou seams is the stage to which exhaustion of mineable coal has proceeded.

The most recent report dealing with the geology and coal-reserves of Pictou County was made by Dr. Walter A. Bell (The Pictou Coalfield, Nova Scotia. W. A. Bell, 1940. Memoir 225 of the Geological Survey) to which the Commission is referred. As bearing on estimation of unworked coal Dr. Bell reports:

"On account of the extreme variability both in  
"thickness and quality of the coals of this coalfield  
"within short distances, the writer believes that esti-  
"mates of reserve tonnages of workable coal would in  
"most instances be so subject to error as to have little  
"value."

The structural geology of the Pictou field is now more clearly understood than at any previous time. The coalfield has arrived at a final stage of commercial operation.

This will consist of such salvage of worked-over areas as may be found commercially feasible. Any extension of existing colliery territory that may be found workable will be



limited by cost of extraction. The future problems of this field are bound up with the cost of producing coal.

As I stated yesterday the question of the future operation of the McBean seam is reserved, and that will be dealt with by Mr. Harold Gordon.

#### THE JOGGINS-SPRINGHILL AREA

These two areas are shown on the same geological map, and generally referred to together, but they are two unconnected separate deposits.

#### JOGGINS AREA

The coal-seams seem to have been deposited in a long narrow basin, extending inland from Chignecto Bay for some 19 miles and extending also for some distance under the Bay in the general direction of New Brunswick. The coal-bearing deposit as originally formed was tilted and much of the original coal deposit removed by erosion, so that the outcroppings show the seams at maximum thickness. The seams diminish in thickness as they go to the dip and will continue to thin until they run out at the edge of the original deposit.

The deposit can be regarded as one producing for local consumption, with a limited operating life. I would refer you on that to a paper written by Mr. Norman Avarð and presented to the Mining Society of Nova Scotia at its last meeting in Kentville, "Longwall Mining in Thin Seams," Joggins Coal Co., Ltd., Joggins, N. S.

#### SPRINGHILL AREA

This is a detached area, occupying what seems to have been an elliptically-shaped depression. Part of the Original deposit has been eroded, leaving a line of seam outcroppings about six miles long between the points where the seams terminate in barren rocks north and south.

The seams dip under newer rocks and their extent is not known. The No. 2 Seam has been followed at full development to a point where there is approaching 4,000 feet of vertical cover.





At this point the inclination of the measures show a tendency to lessen.

There are five workable seams, of good thickness and quality, and this deposit as already stated is a valuable reserve of coal for a long period to come.

The latest revision of the geological mapping is Map 337A issued 1938 with notes by Dr. W. A. Bell.

Then there is the interesting possibility of a concealed coalfield at Halfway River. Near Newville, at Halfway River Lake (16 miles south-west of Springhill) a bore-hole was put down by the Standard Coal & Railway Company which is reported to have bored through nine feet of coal at a depth of 2,550 feet. That was reported in Transactions of the Nova Scotia Institute of Science by Mr. H. S. Poole, an eminent mining engineer of an early date, and also by Richard H. Brown, a son of Richard Brown, so there is no question of the probity and the knowledge of the people who did this exploration, because they were among the first mining engineers in the country.

This is all that is known. The drill used in the Newville Boring was a churn-type drill which does not produce a core. Prospecting with modern core-drill apparatus would prove the ground. So far as is known or conjectured there is no other locality in Nova Scotia or New Brunswick where a concealed coalfield may be present.

The Department of Mines for Nova Scotia has announced its intention to prospect this concealed coal occurrence by drilling. I have reason to believe that Dr. Cameron will make some reference to that.

MR. FRAWLEY: Have the coal-mining rights of this area already been leased to someone?

DR. GRAY: I don't know, no.

MR. FRAWLEY: They are still in the Crown?

DR. GRAY: I think so. Now there is appended to the submission a transcript of our submission to Dr. Dawson, but



unless the Commission desire we do not propose to read that.

COMMISSIONER McLAURIN: We will undertake to read it.

DR. GRAY: Well, that generally completes our submission.

THE CHAIRMAN: Thank you, Dr. Gray.

MR. FRAWLEY: Mr. Chairman, I propose to defer any examination of Dr. Gray to a later date but I understand that the Union would like to examine Dr. Gray. Now perhaps I should make this observation: there will be other briefs immediately following by the Dominion Company and it might be that the Union would wish to defer its examination until the conclusion of the Dominion submissions, but if the questions relate particularly and only to what Dr. Gray has just said . . . .

MR. WADE: As I understand it, this brief here sets out certain general propositions; certain principles, as it were. The other briefs will be of a very much more detailed nature, as I understand it, so that I have certain questions in connection with these general propositions here that it might be useful to get some information on now.

BY THE CHAIRMAN: Go ahead. You will understand, Dr. Gray, the oath that I shall give you concerns only facts within your own knowledge; opinion you will indicate. I want to make that plain.

DR. F. W. GRAY Sworn. Examined by Mr. Wade.

Q Could you turn to page 7, Dr. Gray? Near the bottom of the page there is a sentence which reads: "Coal usage since 1940 is admittedly quite abnormal and unrepresentative of peace-time consumption." In the context of that sentence I don't understand the word "abnormal". Presumably you have some measurement of normal?

A I think the extent of abnormality is indicated further where I suggested that the 1939 basis was more representative.

Q I take it that that one refers to normalcy or normality. In economic things of this kind one usually thinks in terms of national income. In 1939 the normal national income was around four billions. Today, as you doubtless know, it is





around seven billions. Now are you suggesting that we are going back to a national income of four billions?

A I am not prepared to make any suggestions on that line at all. I don't know.

Q So that you are not prepared to state with any precision exactly how you arrive at what is normal?

A My remarks are addressed only with reference to the probable use of energy. Energy to a large extent depends on national activity but the question of national income is a very much debated question. I have no opinion.

Q Throughout the brief--we can take page 28 as an example. It is estimated that post-war production will vary between seven and eight million tons. I was under the impression that that was a careful estimate based on your opinion as to what is going to be normal after the war, is that right?

A Just what was the reference, sir?

Q Page 28. There is a schedule there of tonnage rates and I think it is implied somewhere on that page that around seven or eight million tons is what you expect to be the post-war production?

A Yes.

Q I thought that was based on a careful estimate of what is going to be normal after the war?

BY MR. FORSYTH: There is no suggestion on this page that that is what it means at all.

A No, I said the productive capacity of the mines, given the markets.

BY MR. WADE:

Q Well then, your estimates of post-war production are not based so much on what the possible market will be, is that right, but on what you think the mines should produce, is that correct?

A No. I have given two sets of figures; one, what I think is the capacity of the mines, and another, what I think is the available market, judging the future from the past.





BY COMMISSIONER McLAURIN: Regardless of the Canadian market, if it expanded to five times what it is today, those fields as you now know them could not produce more than seven or eight million tons a year?

A Yes.

BY MR. WADE: Is that what you say?

A That is what I say.

Q So that your estimates of post-war markets have nothing to do with the question at all of what you are going to produce?

A They are two different subjects.

Q Yes, but if the field won't produce more than seven or eight million tons it doesn't matter what the Central Canadian markets are?

A That's right. I think you may hear from Dr. Cameron some corroboration of that type of reasoning and I prefer that his figures would be received rather than mine, but from my own knowledge and experience I would say that we have a limited productive capacity in this province and while we may increase it temporarily we would only deplete our areas to such an extent that we would damage the future of the coal-field--the future livelihood of many generations.

Q Now I take it that the record of this corporation is at least open to the interpretation that it is managed by very competent business men?

A I would hope so.

Q Now I suppose that you would agree with me that one of the elementary principles followed by any good business man is that if he has two alternative channels of investment which he estimates will net him roughly the same return that he is going to choose the less risky one, is that right? I think we could agree that is commonsense, is it not?

A Well, I cannot speak for the actions of anyone else but it seems reasonable to me.

Q Now do you think that that question of commonsense business principles enters into the question at all of the decision



to how many tons of coal are going to be produced by the Dominion Coal Company after the war? In other words, if I have not made myself clear, isn't it rather risky to step up production by opening new seams, for example, step up production to 12 million tons, let us say, when you could make a reasonable return on a nice stable market of seven million tons? Does that consideration enter into the picture at all?

A I don't think it is a question of determination of a policy. I think it is a question of limitation of resources.

Q You mean to say that there are no unused coal-beds in Cape Breton?

A I don't know of any. They may not be used at the moment but they are required for future use and a great bulk of reserve is submarine and to them access is greatly limited.

Q Port Morien would come under that category, would it, Blockhouse and Gowrie and Spencer? I am not very familiar with those terms.

A I think any questions along those lines will be dealt with by Mr. McColl.

Q Would you mind turning to page 35. There is a paragraph there which reads: "The whole of the Sydney coalfield is under lease to the Dominion Coal Company and the Nova Scotia Steel & Coal Co., and is as fully operated by these two companies as seems advisable having due regard to reserves of coal required for continuity of future operations."

Now, Dr. Gray, I presume that the whole tenor of your thesis here would indicate that you consider decisions as to how long these coalfields are to be made to last, such decisions are of great national importance, are they not?

A Oh yes, I would think so, insofar as decisions are possible.

Q But you do have to make such decisions, do you not, because you just told me that you have a certain idea as to how many tons should be produced per year in the future. I presume that is based on some estimate of the length of time to





which the reserves of coal can be made to last?

A No, that is based on an estimate or an idea of a limited annual tonnage it is possible to extract, not by a matter of decision of a Board of Directors or the mining engineer but by governing physical conditions which must be accepted. You must cut your coat according to your cloth.

Q Well, what does this sentence mean then: "is as fully operated by these two companies as seems advisable having due regard to reserves of coal required for continuity of future operations"?

A I think it means exactly what it says.

Q That is what I thought. And you have also agreed with me that decisions as to the extent to which you operate these mines as referred to in this sentence here are of national importance, and you have also agreed that they are of still greater importance to at least 100,000 or 125,000 people in Nova Scotia. Such decisions are of overwhelming importance to these people, are they not?

A You say so, yes.

Q You don't care to answer that question?

A Well, I think it is fairly obvious.

(Next page 107)



Q. Well now, how many generally make those decisions, Dr.?

A. Well now Mr. Wade, if you refer to the chronological statement, or general history of mines of the Coal Company you will find that over a very long period that has been the general result, consensus if you like to say so, of the views of many men, for many years, under many periodic conditions, and I suggest that the operation of the collieries is not so much a matter for any set of engineers, or Board of Directors, but is dictated by the markets and annual conditions, and by the general prudence and workmanlike operation of a mine; that you can hardly put to the credit, or discredit, of anyone, any one man, or any one set of men.

Q. But bearing in mind that there must be some group of individuals who decide what is prudent and what is workmanlike, would you care to tell the Commission approximately how many men make those decisions of what is prudent and workmanlike?

A. How many men?

Q. Is it a large body of say 100 men, or three men, or how many officials of the Company?

A. I think it would take in all the officials of the Company from the mine manager up.

BY THE CHAIRMAN - Plus the Mines Department of Nova Scotia?

A. Yes.

BY COMMISSIONER McLAURIN - And the advice of perhaps even miners working at the face?

BY MR. WADE - I would suggest that the miner working at the face would have no say whatever.

BY COMMISSIONER McLAURIN - My experience with mines does not go very far, but I understand the pit operators or underground employees with consult with the contract miners as to how a particular position, or particular room, might be worked. And at some stage of mining operation there is a matter of a working face.

BY MR. FRAWLEY - And if that condition does not exist, perhaps it should?



BY MR. WADE - I am talking of more important things than day to day operations. Who makes the decision as to whether they will mine the Port Morian seam?

BY COMMISSIONER McLAURIN to MR. WADE

Q. What are you talking about, week to week, or month to month, or decade to decade?

A. I am talking about who makes the decisions about something that will last for a hundred years say.

Q. Don't you have to start with the day to day operations?

A. I can't quite see what connection day to day operation has with a decision as to whether Port Morion Seam should be working.

BY THE CHAIRMAN - In addition to all the personnel of the Dominion Coal Company, there has to be some judgment on the part of the Mines Department, or if you wish, the Government of Nova Scotia, because they have a lot to say as to whether a new operation is going to start, or close down.

BY MR. WADE - Is it true then, Mr. Chairman, that the Mines Department in Halifax can order the Dominion Coal Company to open up a seam?

BY THE CHAIRMAN - I don't know what their powers are, or what powers they exercise. I dare say under certain conditions they might exercise such a power.

BY MR. WADE TO DR. GRAY (continued)

Q. It is true Dr. Gray, is it not, that the Municipality, the Union, the Provincial Assembly, and the Boards of Trade and organizations of that kind are not consulted on this question? Are they?

A. I would not think so except if in the public interests it seemed necessary, and certainly anything that the Company did would have in view the general welfare of the whole community. I think the Board of Trade would tell you that.

Q. You always have in view the welfare of the whole community?

A. I think so, yes.





Q. It is rather difficult to understand for the common sense business man sometimes. However, on page 28 there is a reference to seven million tons would give reasonably full employment to the Nova Scotia collieries. I ask you what your concept of reasonably full employment is?

A. The Memorandum has been conceived with the idea of full employment being five days a week at the mine.

Q. That would be 250 shifts?

A. 250 days a year.

Q. And of course that, I believe, would not take care of the increase in population, does it, in Cape Breton?

A. That is hardly our concern.

Q. That is not your concern?

A. If you have an increasing population Mr. Ward, and a static production, certainly that will not take care of increasing population. It is not possible to show that.

Q. So in deciding your policy as to the volume of production you ignore the question of increase in population, and how those people will find employment?

A. Our policy is very largely decided for us by annual conditions.

Q. Now on page 30 there is a reference to steel production, that is to say, to the coal that will be used in steel production after the war, 750,000 tons, which is a reduction from 1,400,000 now. Does that imply a reduction in steel output of approximately the same proportion? Does that imply a reduction in steel output of around the same percentage?

A. Mr. Kelley can answer that better than I can, but if you will refer to the previous line, I substituted there 750,000 tons for actual consumption in the steel industry in 1937, for 500,000 which was decided by economic conditions and markets at that time. I thought it a fair assumption because all of these are very largely estimates and guesses, and that 750,000 would be a more likely average of steel company usage over a long period. As to the future of the steel industry, I



think Mr. Kelloy will attempt to answer that.

Q. On page 63 Dr. Gray, there is a small point, nearly at the bottom of the page. You said in effect that the sales in Ontario and Quebec markets are limited only by the transportation question. Is that right?

A. There are several conditions there. Limited by ability of the mines to produce in the first instance.

Q. Does not the quality of the coal enter into it?

A. I think we will leave that for Mr. McLanders.

Q. One last question on mechanization. Has the Company any engineers, does it employ any engineers who are engaged on attempting to develop specially designed loading machines for the mines?

A. Well we have our Mining Engineer and we have his assistants. I think the whole world is at the present time, particularly the Americans and ourselves, looking to such things.

BY THE CHAIRMAN - You have at the present time a man looking into the whole question of mechanization, including getting proper loading machines to suit your conditions; perhaps two of them. I am referring particularly to Mr. Weir.

A. That is so.

CROSS EXAMINED BY MR. FRAWLEY

Q. We have talked a lot of your opinion of the capacity of the mines to produce between seven and eight million tons. How do you arrive at that capacity? Just what do you have in mind? Many factors would enter into it? Would you say briefly what you mean when you use that expression "the capacity of the mines"?

A. Perhaps the word "ability" might be better.

Q. The ability of the mine to produce?

BY THE CHAIRMAN - I think "capacity" is absolutely the proper word.

BY DR. GRAY - Take for example Mr. Frawley our No. 1-B mine. It has a capacity to produce at this time about 3200 tons per day, and is only producing around 2000 tons because





of the shortage of man power. But the capacity is still there.

Q. What you had in mind was an adequate working force?

A. And a market.

BY THE CHAIRMAN - They have the equipment, and they know pretty well what that condition, 5 days a week or whatever it is, will produce.

EXM. BY MR. FRAWLEY (continued)

Q. Did you go back and look at what some of the maximum figures were from these mines in other years? Did that enter into your calculations at all?

A. Oh yes. In the month of December our mines usually work to full capacity to get a good pay for Christmas, and on the 13th of December this year we had an output of I think about 10,900 tons, which expresses the maximum ability of our mines today based on man power to produce. On that same date in 1939 the same collieries produced 22,200 tons. That drop from 22,000 to 10,000 is an indication of the extent to which our production has fallen, but our ability to produce is still there.

Q. I really think there was a little misunderstanding about what Mr. Wade was talking about when he spoke of the opening of the Port Morian seam. Suppose, for instance Dr. Gray, that the newspapers, or some people started a campaign and said, We want the Port Morien seam opened up, then your officials would sit down and study it and decide whether it should be opened up. It is your Company's goal, and you are not opening mines because some newspaper, or some group of people, said so. The Management of the Company would give that thought and state whether or not the seam was to be opened up?

A. That would be the normal business procedure.

Q. Depending on the importance of the matter, it goes before the Board of Directors?



A. Not necessarily. That would be decided by our local engineers.

Q. A matter of that kind would not reach the Board of Directors at all?

A. That would be a matter for the Local Management.

BY COMMISSIONER MORRISON - Surely the local management is not conferred with power of Capital Expenditure for opening new mines? That is a matter for the Board of Directors I would say.

EXM. BY MR. FRAWLEY (continued)

Q. I do not know to what extent the Union may be developing these things. But we have it from you that with the assistance of the General Manager, that the matter of the opening, or non-opening of the Port Morien Seam would be decided yes or no by the local management of the Dosco Company?

A. The Board of Directors of course has control of all our expenditures, but they rely on the advice of their local advisers. They would take the advice and rely on the judgment of the local technical manager.

BY THE CHAIRMAN - And further, the Government, or the Department of Mines, might say "we do not want those mines opened at the present time. Apart from the question of anything in the Act, the Mines Department of Nova Scotia have a policy regarding the development of coal seams and coal operators. Notwithstanding the Company might say they were going to open this, the Dept. of Mines might say it should not be opened, and then I do not think that the Company would open it.

EXM. BY MR. FRAWLEY (continued)

Q. The Crown, in the right of the people of Nova Scotia, is the Lessor of these coal rights?

A. Yes.

Q. They give you a contract called a lease?

A. Yes.



Q. That has 15 or so clauses in it I suppose, and that determines your right as to how or when you open up those seams, I take it?

BY MR. FORSYTHE - I do not think Dr. Gray is the man to answer that.

BY DR. GRAY - I may say that the whole question of P.M.O. is an analogous matter and will be dealt with by Mr. McLanders.

BY MR. FORSYTHE - I take it that this question of the seven to eight million tons of coal was access to the coal and ability to remove it from the pit; that you were of the opinion that seven or eight million tons could be reasonably produced by these mines under post-war conditions if they could find a place to sell it?

A. Exactly.

BY MR. FREEMAN JENKINS TO DR. GRAY

Q. Dr. Gray, you mentioned in your brief on two or three occasions of the high efficiency of the management of the Company in planning and carrying out this submarine mining. Would you care to say that the employees employed in and around the collieries are also very highly efficient concerning the work?

A. Do you mean as individuals?

Q. That is right, Dr. Gray.

A. I think so, yes.

Q. There is another question, on page 21 I believe, at the bottom of the page, "Annual income for workers \$1,121."

Does that figure include the cost of the coal miner's powder and pick-handles and tools, which he must buy in order to carry on his work?

A. Oh no.

Q. You were talking yesterday and you said that was the average gross earnings.

BY MR. FRAWLEY - He said it was the total of the Company's payroll, that is what he said finally. \$13,617.42 is what Mr. Jenkins is speaking about.





BY DR. GRAY - That is got by dividing the tonnage into the wages earned. Deductions for powder and oil and that sort of thing are not wages.

BY MR. JENKINS - I was trying to get that clear in my mind Dr. Gray. They have a pay envelope here. I want to get it clear in my mind just what was included in this "Annual Income for workmen". I want to figure out in my mind whether that is the average without the cost of his powder and supplies being deducted from it.

BY MR. FORSYTHE - That average must apply to people who do not buy powder or oil, so you cannot talk about powder and oil in connection with that average.

BY COMMISSIONER MORRISON - If they were charged it would certainly bring the average down.

BY MR. FORSYTHE - If you took only producers you would have a higher average to start with before you brought it down. What I am suggesting is that the answer to that is that the total pay of the Company was so much, and they had so many employees, and they divided the first figure by the second to get the average income?

A. Yes.

BY COMMISSIONER McLAURIN - Taking the individual getting \$1,100. and being a contract miner there would be deducted from that explosives, etc.

A. That is it. (This A. by Mr. Jenkins)

BY DR. GRAY - I think I recollect the use of the word "gross". Where a man has a deduction for coal, that is included in his wages of course, but his operating expenses, such as you mention, they are deducted, they are not part of the wages at all, they come off, they are never included.

BY FREEMAN JENKINS - In other words the wages paid to the workers at the collieries, that does not include the cost of their explosives and supplies?

BY DR. GRAY - Oh no. And that figure is not a figure of the Dominion Coal Company, it is merely a figure of the Bureau of Statistics covering the whole of the coal mining in



Nova Scotia, the wages paid divided by the number of men.  
That includes all the coal mines in Nova Scotia.

EXM. BY MR. FRAWLEY (continued)

Q. There was a figure of about fourteen thousand which I understood you to say was the total of the collieries payroll?

A. In Nova Scotia, yes.

Q. The miner has to pay something for the powder he uses?

A. But that is not included in this at all.

Q. Does he take powder from the company's stores?

A. Yes.

Q. And he has to pay for that?

A. Yes.

Q. It is part of the contract?

A. Yes.

Q. He pays for that himself?

A. Yes.

Q. He buys that and pays for it out of his wages?

A. Yes.

Q. And to facilitate the keeping of your accounts, you take that out of his gross wages?

A. We keep an account but it is never included in the wages.

Q. If a man earns \$50. a week gross without any deductions, do you not make a deduction to pay you for the powder he uses?

A. Yes.

Q. Then it is a deduction just like his miner's dues?

A. Yes, but we make a lot of returns to the various Government bodies as wages, and those are never included.

Q. But is this figure here a gross figure before any deductions are taken off?

A. No, it is not.

Q. After all deductions are taken out?

A. After deductions of powder and explosives.

Q. It is a figure that is halfway between the gross and the net?

A. No.

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Q. It is a figure which some things have been taken out of? A man earns "X" dollars gross, less the cost of the powder and other supplies, but not less other deductions like union dues, church contributions, etc.?

A. That is right.

BY MR. FRAWLEY - Mr. Chairman, I had intended to proceed with Mr. McLanders, but Mr. McColl has now filed with the Commission three briefs which certainly are supplementary to what Dr. Gray has said, and I think perhaps they should be heard now, but they were only put into our hands last night.

BY MR. FORSYTHE - If it is possible to do it we must get Mr. McLanders through as quickly as we can because he and his whole staff are here in Sydney, and that is not where they do their work; so I would prefer to have Mr. McLanders go on now if possible.

HEARING ADJOURNED UNTIL 2:00 P.M.

2:00 O'CLOCK P.M.

MR. T. S. McLANDERS, examined by Mr. Frawley

Q. You are an officer of the Dominion Steel & Coal Corporation, Limited?

A. That is correct, Sir.

Q. And what position have you with that Corporation?

A. General Manager of Coal Sales.

Q. And as such you have come here to make a submission?

A. Correct.

Q. You are filing -

1. Brief on Market Supplied by the Dominion Steel & Coal Corporation, marked Exhibit S/6.
2. Supplementary to that brief is a volume called "Supporting Statement to the Brief on Markets" marked Exhibit S/7
3. Research Reports, Tests, etc. submitted with the Brief on Markets - Section 1, Industrial, marked Exhibit S/8.
4. And the same subject, Section 2, Domestic, marked Exhibit S/9.



A. That is right.

BY MR. McLANDERS - Mr. Chairman and Gentlemen of the Commission: I shall now proceed to read the Brief on Markets submitted to the Royal Commission on Coal by the Sales Department, Dominion Steel & Coal Corporation.

Wherever the Dominion Coal Company's name is used it is held to include all the coal producing companies affiliated with Dominion Steel and Coal Corporation, and where the term Nova Scotia coal is used it is held to mean coal produced by Coal Companies affiliated with Dominion Steel and Coal Corporation.

PREAMBLE

The market built up for Nova Scotia coal over a period of nearly half a century has suffered in that period two major dislocations, the first in World War I and the second in World War II. Many lesser interruptions such as the incidence of Hydro and Oil have been experienced, but none of these, while serious enough in themselves, have had such sudden and far reaching effects as the dislocation caused by War.

Since the outbreak of the present war, conditions have imposed an almost completely new orientation of the territory in which Nova Scotia coal is now distributed. In 1939 the territory served, in whole or part, by Nova Scotia coal extended from Newfoundland to a line drawn from Sudbury to Windsor in Ontario. In 1940 it was found necessary to retreat from Ontario to the extent of about half the tonnage of 1,400,000 tons sold in that Province in 1939 for the contract year May 1st, 1939, to April 30th, 1940. The coal thus released was made available for use in the Eastern part of the territory, mostly for Bunker, Railway and Industrial use, and Navy, Army and Air Force establishments.

The following year, due to still greater demand in the East, and contraction of output, the balance of the



Ontario market plus a part of the Quebec market had to be abandoned, and the process of contraction has continued until in 1944 only 350,000 tons of Nova Scotia coal was marketed in Quebec Province and even this small tonnage would not have moved had not approximately 600,000 tons of U.S.A. coal been shipped into Newfoundland and the Maritime Provinces, principally for the National Railways.

This shortage of coal for the central market presented a grave problem. Was the Dominion Coal Company again to have the market they and other interested bodies had struggled to establish pass into the hands of other suppliers? Were the docks and all the equipment on them to lie idle or be used by other organizations until the war ended and Nova Scotia coal became available? This is precisely what happened in War I with such disastrous results - customers lost are not easily regained.

So in order to retain control of the market, keep the organization functioning in a healthy manner and to serve the national interest, the Dominion Coal Company, after giving full consideration to the factors for and against and fully appreciating the obstacles in the way, decided to import American coal and maintain a ready made market for Nova Scotia coal as soon as it is available. The Dominion Coal Company's docks and handling facilities on the St. Lawrence River are proportionately so large that they must be employed in time of war to handle the greatly increased tonnage of coal required. Many consumers within a short radius of the docks have no storage capacity or rail connection and depend upon daily deliveries ex. dock by motor truck.

Almost without exception, users of Nova Scotia coal appreciated the situation brought about by war conditions, accepted the substitute coals and look forward to the day when the Canadian product will return.





CHAPTER I

TERRITORIAL EXTENT OF MARKET FOR CANADIAN COALS EXCLUDING SUBSIDIES, SUBVENTIONS OR TARIFFS. Without any assistance of any kind.

With today's cost of production and without assistance of any kind, Nova Scotia coal would not find a market outside the Maritime Provinces and a part of Newfoundland, and some points in this territory where transportation is advantageous would be vulnerable to high grade southern coals from such producing areas as the New River Field and Pocahontas. The Fairmount coals, so similar to Cape Breton coal, would offer competition as well. Fairmount is in the north part of the state of West Virginia. In today's market Fairmont run-of-mine can be purchased trimmed in vessel Baltimore at \$6.50 or less per ton.

BY MR. FRAWLEY - Where is the New River field, in what state?

A. In southern West Virginia.

MR. McLANDERS (continues)

Cornerbrook, Newfoundland, is an example of a vulnerable point. American coal transported by vessel via the Great Lakes and St. Lawrence, on the freight rate established by the Canadian Shipping Board, lays down at Cornerbrook for \$8.18 per ton as against \$11.16 for Cape Breton coal, a difference of \$2.98 in favor of U.S.A. coal. Only the present high rate of ocean freight by large vessels forming an abnormally large part of the delivered price allows Cape Breton coal to be competitive in Newfoundland. The shorter haul from Sydney as against the longer haul from American East Coast ports is represented by a differential of \$1.14 per ton. In normal times this would shrink to an inconsequential amount cancelling the advantage now held through geographical position. Shortage of canal sized steamers restricted competition from the Great Lakes ports but it is a fact that during the season of navigation in 1944 American coal was actually delivered to Bowater's Paper Mills at Cornerbrook, Newfoundland, for \$8.18 per ton. (net ton).



BY MR. FRAWLEY - What is the difference between net and gross tons?

A. One is 2000 and the other 2240.

MR. McLANDERS (continues)

A better picture, and one more comparable with probable post-war conditions, may be had by examining the year 1939. During the year a total of 6,262,994 tons was distributed of which 2,320,726 tons was marketed in Quebec and Ontario through subventions to the amount of \$2,792,373.28. This figure does not take into account the duty of 75¢ per ton on American coal.

BY MR. McLAURIN - Does American coal come in over a duty of 75¢ now?

A. Yes, except that there was remission of duty for a time, but there is 75¢ duty now except for drawback supply.

Q. But there is no duty on anthracite?

A. No.

MR. McLANDERS (continued)

In May 1939 Fairmont slack coal, very similar to Dominion and of equal heat value, laid down on dock Montreal for \$5.20 per ton or in some instances less. The price made up as follows:-

3/4" slack in cars mines, Fairmont.....	\$1.25
Freight, Mines to Fairport, Lake Erie.....	1.85
Vessel rate Fairport to Montreal.....	.85
Duty.....	.75
Dock charges.....	.50

Laid down cost Montreal dock.....\$5.20

If duty is taken out, laid down cost becomes \$4.45.

To compete, Dominion coal would have to lay down at same cost. Taking from \$4.45, cost of rail freight from Mines to Piers, loading and trimming charges, water freight and dock charges, totalling not less than \$1.50, coal would have to be produced at \$2.95 per ton on cars Mines.

Actual quotations are known to have been made in 1939 for blocks of as much as 50,000 tons at \$4.54 f.a.s. Canal Bank, Montreal, including duty, or \$3.79 excluding duty.





Moreover, \$1.25 was maximum for Fairmont slack - it sold lower in many instances. There is record of one block of 20,000 tons Fairmont slack coal sold for 55¢ per ton in cars Mines, February 1939.

BY COMMISSIONER MORRISON - How does that price compare with today's price?

A. Today's is \$2.40 a ton.

Q. F.O.B. Fairmont?

A. Yes sir.

MR. McLANDERS (continues)

It is obvious that without tariff protection and other assistance, little if any Nova Scotia coal could have penetrated the St. Lawrence market in 1939. Prices of American coal are very unstable in this period and it was virtually impossible to determine exactly what had to be met, so many and varied were the fluctuations.

On October 1st, 1940, minimum code prices established under provisions of the Bituminous Coal Act of 1937 became effective and had a stabilizing effect on prices; at least the lowest price obtainable by competitors should be gauged. These minimum code prices continued in effect until August 24th, 1943, when the Bituminous Coal Act expired. Much discussion has centered around its reenactment which, if it takes place, will be beneficial to the Canadian coal industry. The level at which minimum prices are set will be the measure of its helpfulness. Without its reenactment it is difficult to see how chaotic conditions in the marketing of American coal can be avoided.

Strip Mines in the U.S.A. have multiplied so rapidly during the last three years that their total output now approximates 100,000,000 tons per year. It may be slightly under 100,000,000 in 1944. Admittedly much of the coal thus produced is inferior in quality to deep mined coal but for some unknown reason the price fixed by O.P.A. for



strip coal in a given district is, with a few exceptions of an insignificant nature, the same as for the deep mined product. Strip mines produce as much as 20 tons per man day, in some instances more, consequently their cost of production is much lower than deep mines and many of them have little or no capital invested in fixed installations.

Unless minimum Code prices are reestablished, the strip mines will set the pace in competition and prices will plummet downward just as soon as demand slackens. They can afford to substantially undersell the deep mines at every turn.

BY COMMISSIONER MORRISON - "They can afford to substantially undersell", that is to the extent that they are able to produce?

A. Yes, to the extent of their production they will be able to undersell a corresponding tonnage produced in deep mines.

Q. Roughly I would say about one-seventh?

A. About that.

MR. McLANDERS (continues)

Statement "E" is appended showing the laid down cost of U.S.A. coal at key points in Ontario and Quebec in 1939, - what these laid down costs will be, say in 1946 and later is a matter of speculation since so many unpredictable factors are involved. For example, will the exchange rate remain as at present or increase or decrease? What will happen to water freighting costs? Will minimum Code prices be re-established and, if so, at what level? Will the war tax remain and at what rate? Will duty of 75¢ per ton continue unchanged. All these factors will enter into the laid down cost of U.S.A. coal after the war, and must be taken into account in the formulation of any scheme of assistance which may be devised. Flexibility should be provided to take care of variable factors.

Now we have a map here. This map is a graphic depiction of the sales of Dosco coal all over the territory, including the Maritimes and Central Region, in 1939. Now I





have been wondering what would happen if we had no customs tariff. This is the whole territory in which our coal was distributed in 1939. I have just been seeing what would happen with the elimination of duty and taking away of subventions and subsidies, and I cannot do better than turn that map over. It speaks louder than words. There is what would happen to the market for coal produced in this country. Without tariff and subventions it would blank us out to the extent of 3,480,000 tons in 1939.

(Map marked Exhibit S/10)

Now assuming that that disastrous thing could happen, and mind you there will be individuals and corporate bodies who will advocate the remission of duty for specific industries, and others for the revision of the Customs Act and elimination of duty. Unless the duty was picked up in some other form, we would lose that in the Central markets, and immediately our cost of production for the remaining market would rise, and it would be no time before foreign coal would penetrate Nova Scotia, New Brunswick and Prince Edward Island, and the industry would die. So we must have a continuation of subventions if we are to get that market. And I see no reason why we are not justly entitled to reasonably fair assistance, and I make that plea on the score that there is not a major coal producing country in the world that has not assisted its coal industry, including Czechoslovakia, Poland, France, Germany, Britain - and someone might say "What about the United States, When they established a minimum coal price they put the price up to the consumer." Whether they did it through tax or increasing the price, it is the same thing in another form, so I say we can still hold our heads up and look the rest of Canada in the eye, and industry in the eye, provided everyone in the industry does his part to see that we are producing as economically as possible, from the Office Boy to the Manager. When we have





done that we have the right to ask for assistance from Canada, and it is no more than any other nation has been giving to their coal industry.

BY COMMISSIONER McLAURIN - This minimum price remained in force in the United States until when?

A. Until August 4th, 1943.

Q. Almost three years?

A. Yes sir.

BY COMMISSIONER MORRISON - Your last line says "flexibility should be provided?"

A. I mean any scheme of assistance that might be devised should be such that with a sudden jolt the machinery is there to take care of it and you don't have to close your mine.

Q. In some countries they had a sliding scale, but the history of that was it only slid one way. Now this flexibility on any assistance arrangement should at least conform to a minimum, at least some continuity.

A. That is what I have asked for, continuity and permanence, but within it the system should be that you can change gears if you have to go up a hill.

Q. But no reverse gears?

A. You don't expect in the coal industry to have to reverse any more.

MR. McLANDERS (continues)

## CHAPTER II

TERRITORIAL EXTENT OF MARKET FOR VARIOUS COALS  
TAKING INTO ACCOUNT:

- (a) Tariff Protection
- (b) Peace Time Subsidies or Subventions
- (c) Wartime Subsidies or Subventions.

### (a) TARIFF PROTECTION

It was stated in Chapter I that without assistance of any kind Nova Scotia coal would not find a market outside the Maritime Provinces and Newfoundland. Now what additional market may be expected with the tariff protection of 75¢ per ton. Under today's conditions it would make little difference, but in normal times it was a very important factor. It permitted a market in Quebec and Eastern Ontario for a



substantial, though inadequate, tonnage in the years prior to subventions and given the same relative differentials in the items of laid down cost of Nova Scotia and U.S.A. coal in post-war years this protection again would be effective to the same extent. There is room for doubt as to whether water transportation from Sydney to the St. Lawrence will be available at the rates obtainable before the war. Cost of producing ships and the expense of operating them has so increased that it is hardly likely that transportation rates will recede to their former level. In 1939 there was moved into Quebec and Ontario on subvention 2,320,726 tons out of total sales of 3,480,000. In other words with tariff protection alone approximately 1,285,251 tons would have found a market outside the Maritime Provinces and Newfoundland, or a total disposal in all areas of 4,068,018 tons. That means that the tariff alone would have permitted us 2,185,000 tons of coal.

BY THE CHAIRMAN - Up to 1925 the duty was 51¢ or 52¢. Was there any change after the increase to 75¢?

A. It was not sufficient to make any difference in the penetration of the Ontario market.

BY MR. FORSYTHE - I think the Chairman asked you the difference after the increase to 75¢.

BY THE CHAIRMAN - In 1925 there was an increase to 75¢.

A. That would not permit entry into the Central market.

Q. But my question was, was there any change? Did it assist you? Oh my yes, of course. Every 5¢ or 10¢ is a help. There are plenty of places where you are in competition within 20¢ or 25¢, but if you get 10¢ or 15¢ you can always persuade the buyer to absorb the rest.

Q. I wonder if we could get some figures on that?

A. We will undertake to get you figures and submit them to the Commission.






MR. McLANDERS (continues)(b) PEACE TIME SUBSIDIES OR SUBVENTIONS

Subventions were adequate in 1939. Based on the cost of production, transportation and handling of that year it was possible to meet competition in Ontario, and had the coal been available, when required, a larger tonnage could have been sold. It does not follow, however, that the same scale of subvention will be adequate in post-war years as there is no way of knowing what the cost of production, handling and transportation is going to be, or what the laid down cost of U.S.A. coal will be.

As I said in 1939 subventions were found to be adequate for marketing our coal. Here is the story of what happened. I might as well deal with the whole territory covered by this map (S/11). In black here is what we refer to as the natural market for Nova Scotia coal and that is a market that we have enjoyed for 50 or 60 years. We were always able to bring coal up the St. Lawrence River, it is hedged in black here. We were able to bring coal there without subvention, with the tariff protection, and bring the coal along up to points on the Saguenay at Quebec, Three Rivers and at our docks in Montreal. When you take coal beyond the canal you must transfer it into the lake size vessels. We were always able to do that. With the advent of subventions, which began in earnest in 1932, we began to go westward, until in 1939 we got into Ontario to the extent of sales of 1,400,000 tons. We actually delivered 1,265,000 tons, and the balance was delivered in the succeeding months in 1940. So you get up here to this triangle is, rail and water shipments external, and the half circle is all-rail shipments ex mines, and these diamond shapes are Quebec, LaSalle and Shewinegan shipments, and the other one is the Quebec buyer which comes under the domestic fuel Act. In that year we were able to get into Ontario and up to these industrial areas, and up to International Nickel, 306,000, and Falconbridge Nickel, and others. Then that circle half



black and half green, that is the one far-away point where we can market our coal without assistance, and that is the Noranda Mines, and since they began to operate they have never burned anything else than coal supplied by us. I am sorry to say it has to be American coal at the present time. In ordinary times we would bring that coal up by large ship loads, load it in the cars and send it along without any assistance. So it is a valuable account. In the Winter it has to go by rail, and a very long route, and we have to have assistance at the rate laid down, or whatever the Government may determine. You might ask why we don't bring it up in the Summer. Because they spray this coal, and the minute they get damp coal down goes the production of copper, and copper is so important that they must have dry coal. They have a storage bank now as an emergency measure.

In the C.N.R. we have enjoyed a heavy tonnage, 437,000 tons, and the  & N.O. 36,000, and the following year I think we put in 100,000, and then we had to withdraw. Then LaSalle and Shewinegan, both users of washed coal, and the Shewinegan use their coke in the manufacture of carbide, and they use coal for making coke primarily and gas as a by-product.

Now the zig-zag lines represent Hudry electric energy, and there is another special map about that. That is all Hydro electric and there is a great development all along there. I won't say any more on that because there is a chapter later.

Now coming down here, this circle is bunker business. It is in and out according to the conditions of trade and according to the number of oil burners that happen to be in the service at the time. The same with Newfoundland. The interrupted lines mean that the business is uncertain, sometimes we get it. The big paper companies





there who send their paper abroad bring back coal, so it is an uncertain market and cannot be regarded as a natural extension. I think that pretty well covers it.

You will notice these half circles which are removed from the St. Lawrence. That is coal that comes all the way from the mines by rail because from your docks is a long back-haul and that gives you a chance at that at a minimum figure. We don't use much all-rail except sometimes in the Winter to supplement coal brought by water in the season of navigation. There is a certain amount that comes all-rail with assistance, but not a very heavy tonnage.

(c) WARTIME SUBSIDIES OR SUBVENTIONS

Now this is not such a pleasant story. So many emergency measures have had to be adopted to get coal delivered where it is needed for war requirements that the present set-up bears little resemblance to pre-war conditions.

In 1940, a year of high production, transportation by water became difficult. Ships were scarce and only such as were unsuitable for war service could be hired, and at a high rate. Rail movement was used to supplement water transportation and in this way the banks built up in the Winter were moved along with current production.

On April 1st, 1940, the rate of assistance on shipments by rail from St. Lawrence terminals to destinations in the Province of Ontario was increased from \$1.50 maximum to the difference in amount per ton between the laid down cost of Nova Scotia coal and the United States coal to maximum of \$2.00 per ton; on shipments by water from St. Lawrence terminals to destinations in the Province of Ontario from a maximum \$1.50 per ton to the difference in amount per ton between the laid down cost of Nova Scotia coal and United States coal to maximum of \$2.00 per ton; on all rail shipments to the Province of Quebec from a maximum \$1.50 per ton to the difference between the laid down cost of Nova Scotia





coal and the United States coal to a maximum of \$2.00 per ton; and on all rail shipments to the Province of Ontario from a maximum of \$1.50 per ton to the difference in amount per ton between the laid down cost of Nova Scotia coal and United States coal to a maximum of \$2.00 per ton.

The high rates of charter required to be paid for steamships were authorized by the Ministry of War Transport, the Canadian Shipping Board, and, later, by the W.S.A. of the United States, all these bodies acting under Government regulations.

Owing to enemy action in Eastern Atlantic waters, ships were required to move in convoy under naval protection, causing much loss of time and consequent increase in transportation cost over and above the high charter rates established for normal movement.

These conditions also caused a very substantial increase in war risk insurance on cargo and steamship hulls.

By 1941 the situation became so acute that for a time it seemed as if the large banks of some 750,000 tons accumulated at Sydney and Sydney Mines during the Fall of 1940 and the Winter of 1941 would not be moved. Some of the coal placed in bank could have been used for current consumption in the Province of Quebec but the Railways were beginning to be so burdened with the handling of other war commodities, principally for export, that they were able to handle only a very limited tonnage of coal during the Winter months for delivery to St. Lawrence points. By the Spring of 1941 water transportation costs had risen to such an unbearable level that something had to be done to relieve the situation, so to compensate the companies for the heavy increased transportation costs the Government, through the Coal Administrator's Department, instituted a plan of assistance whereby water freighting costs were equalized to the companies on actual cost of the year 1940. It should be noted,



however, that 1940 costs were practically 70% over pre-war costs.

On October 17th, 1941, the Coal Administrator, under the Wartime Prices and Trade Board, authorized an increase in the selling price of coal to equalize the cost of living bonus granted to the miners and at this time ceiling prices on the selling price of coal were established by the Federal Government by Order-in-Council P.C. 8527, November 1st, 1941. The base period for establishment of these ceiling prices was September 15th to October 11th, 1941, and making it an offence to sell at a price higher than the maximum price charged during the basic period.

The assistance thus far granted in respect to water transportation costs and increases in wages was unrelated to the rapidly rising cost of production due to the loss of producers and to increased price of materials, increase in taxes, etc., and since no relief could be obtained by way of higher selling price of coal because of the ceiling, mostly all producing companies operated at a loss.

If these ceiling prices were to be maintained it was imperative that to continue production of coal, relief had to be granted to the producing companies for losses sustained in operation.

To deal with this very critical situation of such a national character the Government organized the Emergency Coal Production Board on November 23rd, 1941, P.C. 10674. Primarily the duty of this Board was to stimulate the production of coal so necessary to the country. It also regulated the payment of a subsidy to the Coal Companies to compensate for loss sustained in operations not otherwise provided for, and such further sums as were necessary to maintain the financial position of the companies.

These subsidy payments, as far as the Coal Companies associated with this Corporation are concerned, allowed its





customers such as Railways, Industries and Domestic Consumers to purchase coal produced in Nova Scotia at a price level much below the laid down cost of imported coal. As a matter of fact, since the inception of subsidies the users of coal in the Maritime Provinces have received benefits in this regard amounting to approximately \$35,000,000. which sum is much in excess of the amount of subsidy payable under the regulation of the Emergency Coal Production Board.

By the Spring of 1942 the shipping situation for the Allied Nations became so dangerously critical that every possible steamer of any age or size had to be pressed into service. It was no longer possible to hire ocean-going ships of any age or design to move coal from Sydney to St. Lawrence points. At this juncture the Government authorized the building at Point du Chene on the coast of New Brunswick a coal discharging plant for the handling of coal to be sent on to the Province of Quebec. Some very old lake steamers, laid up for many years, were reconditioned in the shipyards at Sorel and put into the service. The plant opened August 8th, 1942.

They came up through the strait of Canso hugging the shore along the Northumberland Strait until they came up to a point here on the map. This water was too shallow for submarines to operate in, so we were able to do it with safety.

These steamers moved down through the Bras d'Or Lakes along the coast of Nova Scotia to Point du Chene, coal was discharged into cars and sent on to the market in Quebec, but in the case of a substantial tonnage of coal required for the Aluminum Company of Canada it became necessary to transfer the coal in the City of Quebec to an ocean-going vessel which carried it on successive trips to Port Alfred, the receiving port for bulk commodities required by the Aluminum Company. It was not possible to send the coal on by rail from Quebec



to the Aluminum plant because the C.N.R. was already overburdened on the Quebec-Arvida line by the movement of bauxite.

I think I should point out how long and expensive that movement was, and all of which had to be paid by the country, or a great portion of it, and it appears in Hansard as a payment to the Dominion Coal Company. It was on account of conditions of the war, and we were ordered to put it there and it cost so much to put it there. (He describes the route on the map). And away up to Port Alfred, the port of the Aluminum Company, and there it was discharged into the Arvida plant.

BY COMMISSIONER MORRISON - Who devised that scheme?

A. We were ordered by the Government to do it. The thing was the subject of conferences and everything else.

BY MR. FRAWLEY - It was the only way out?

A. Yes, that is why we were ordered to do it.

MR. McLANDERS (continues)

To cover the movement of this coal via Point du Chene-Quebec transfer, a very torturous and necessarily very expensive one, the Government provided assistance by Order-in-Council P.C. 10473, effective August 1st, 1942, up to \$2.50 per ton.

This plant continued to be used in 1943 and 1944 as a supplementary method of transportation.

There were also emergency movements of coal in 1941, 1942 and 1943 through Portland, Maine and St. John, New Brunswick, for furtherance to Quebec points, assistance being granted up to \$2.00 per ton on both movements.

The C.N.R. could not handle the coal in the Winter, so we brought it to Portland and up by rail to Montreal, and we took some around to St. John and by rail on. Also an expensive business.

These various operations have made it possible during the war period to distribute Nova Scotia coal in the areas required in the national interests and as directed by





the Coal Control, Ottawa. They have little or no relation to normal movement in peace time but such arrangements made it possible to continue the full operation of the collieries.

In December 1943 a wage increase of \$1.00 per day, retroactive to November 1st, 1943, was ordered by The National War Labour Board, and on December 31st, 1943, the Wartime Prices and Trade Board authorized by Order A-1054 an increase in the price of coal of 95¢ per ton effective January 1st, 1944.

### CHAPTER III

#### ANALYSIS OF CENTRAL CANADA MARKETS

Central Canada Markets, it is assumed, means all possible outlets for Bituminous Coals in the Provinces of Quebec and Ontario.

For the last half century, Nova Scotia coal has been marketed in the Province of Quebec, and for many years in Eastern Ontario as far west as Ottawa-Cornwall without assistance except the protection provided in the customs tariff.

Beginning 1932 (we say 1932, because we actually started in 1924 as a test, but we always think of subventions actually having started in earnest in 1932) coal began to move to Central and Western Ontario under Government assistance, slowly at first and gaining rapidly from 1934-1939 under increased assistance as shown in detail in Statement "B".

In 1939 Dominion Coal Company disposed of 3,480,000 tons in the Central Market of which 1,300,000 went to Ontario. Insofar as Nova Scotia coal is suitable for the Quebec market, 95% of the outlet was obtained, so that there is little opportunity to increase sales of Nova Scotia coal in Quebec except as may come about by natural growth in demand; it is likely to be the reverse while surplus hydro energy is offered and competition from oil remains intense.

The only market which can afford additional outlet or maintain the 1939 level of distribution is Ontario.





While statistics show importation into Ontario in 1939 of 8,695,365 tons, it is not to be assumed that all this tonnage is open to Canadian coal. Out of this total must be deducted metallurgical coal for the steel industry, gas coal for gas producing companies, coal for the head of the Lakes, smokeless coal for use in cities having Smoke Abatement By-laws, low sulphur coals for brick and porcelain manufacture, coal on which drawback of duty is paid when used in manufacture of goods exported, and the coal consumed by many concerns with equipment unsuitable for Nova Scotia coal. And I should have added coal used in the manufacture of agricultural implements which are duty free. After these are deducted and due allowance made for highly competitive conditions along the water-front of the Great Lakes where coal is delivered by self-unloaders on to private and public docks having no equipment for discharging bunkers, it is estimated that there exists in Ontario a fair field for Canadian coal, given necessary assistance to make it competitive, of 2,500,000 to 3,000,000 tons. In other words the Ontario market when you boil it down, you have left  $2\frac{1}{2}$  to 3 million tons.

BY MR. FRAWLEY - I do not understand what you mean when you say "coal on which drawback of duty is paid when used in manufacture of goods exported." Does that drawback apply to Canadian coal?

A. No, American coal. I tried to get the figures and I have a letter from the Deputy Minister in which he says "On receipt of your letter I made the necessary inquiries and find that in our Drawback Department we have no information covering the coal in any year used in the manufacture of goods exported".

Deliveries in the Central Market in 1939 were made to the following classes of consumers:



Railways	1,200,000	
Industries	1,680,000	
For coking	200,000	(Shawinigan, LaSalle and Quebec Power)
Dealers	<u>400,000</u>	
	<u>3,480,000</u>	

It is to be noted that the Railway portion is relatively high. Having regard to the preparation required for part of their tonnage, there is a limit to the amount of sized egg coal which can be made available. A road such as the T. & N.O. with heavy grades demands an egg coal - this Road was supplied for the first time with sized Nova Scotia egg made on Windmill Point Dock, Montreal, in 1939, and proved eminently satisfactory. Run-of-Mine tried in tests before that year was never acceptable. For fast passenger trains and to meet special conditions, other Roads require egg coal and the extent to which it can be made available is dependent upon preparation and distribution of resultant sizes. A balance in sizes must be maintained in relation to market demand and to obtain the best overall realization per ton. There is no advantage to be gained in making a certain size on a dock if by so doing there is produced resultant sizes which cannot be economically marketed. Mention is made of this point to illustrate the necessity of having access to all classes of coal business in the Central Market and not to stress the Railways to the exclusion of other business outlets. More Railway business is desirable, but it has limits.

Assuming a regular market has been established in Ontario for a substantial tonnage of coal, there will still exist the problem of balancing shipments to the market. What is desired to be conveyed is, that by the very nature of the upward and downward variations in demand east of Ontario there will not be a constant tonnage for delivery each year. It can easily be that in a given year a market will be wanted for 2,000,000 and perhaps conditions the following year would





leave 1,000,000 to 1,500,000 available. What then is to be done to compensate for this in and out feature? Obviously consumers will not relish having Nova Scotia coal one year and not the next. U.S.A. coal will be available to take the place of Nova Scotia coal and this raises the question of how the situation can be best handled to the satisfaction of all concerned. It might be advisable to market a certain part of the Nova Scotia tonnage through old established coal merchants who could distribute the Canadian product along with the imported, and thus establish a scheme of supply that would not upset the consumer.

Another way of doing it would be for Dominion Coal Company to undertake the supply of an interchangeable fuel so as not to lose the connection for Nova Scotia coal when it is not available and to have a ready market when it is available.

The same situation would develop in the case of interrupted production. Contracts made for forward delivery must be protected. The seller cannot just say, "It is impossible to ship, the coal isn't there." That would be disastrous for the next year's business. The consumer has his rights and must be protected - continuity of delivery and service are indispensable to the maintenance of a steady market.

It should be recorded that the reception given Nova Scotia coal by buyers in Quebec and Ontario leaves nothing to be desired. They have not only given it a fair break but in a number of instances knowingly have paid a premium. For this generous gesture the industry and the Province owe them a debt of gratitude.

#### CHAPTER IV

#### EFFECT UPON THE MARKET OF IMPORTS OF COAL AND COKE FROM FOREIGN SOURCES.

##### (a) UNITED STATES

The ever present and inescapable factor in the marketing of Nova Scotia coal is competition which comes



principally from United States. It is present always and unless it is met, or nearly so, business cannot be booked. It has been the experience that Nova Scotia coal frequently gets the preference, many concerns agreeing to a small premium in favor of the home product. But, substantially, wherever Nova Scotia coal is sold, competition must be met.

It is not always easy to gauge what the competition is. However, it is one of the functions of a sales organization to know at what price the imported product is being offered so that the home product can be sold for the maximum price obtainable. It is often a very delicately balanced negotiation where 5 or 10 cents a ton may mean the winning or losing of the order.

There are few markets for commodities that fluctuate so violently as the coal trade of the U.S.A. particularly in times of unsettled trade. It changes almost over night and to keep abreast of competitive conditions in such a vast industry requires dependable sources of information and intimate knowledge of the business if one is not to lose the order, and, at the same time, get the last penny to be had for the home product, which must be the constant aim. It is only too true that hardly a ton of Nova Scotia coal is marketed in Central Canada which does not feel the weight of competition from U.S.A. coal. The very fact that a neighboring country produces 350,000,000 tons per year in normal times, 600,000,000 tons at present (the year just closed was 621,000,000), embracing a range of coals suitable for all uses, is sufficient reason for expecting the impact of constant pressure from surplus coal.

EXM. BY MR. FRAWLEY - What do you mean by surplus coal?

A. There is coal being produced that there is not a demand for in the home land, and it is then offered for export, which happens all over the world in our position of free enterprise.

BY THE CHAIRMAN - That brings up the question of dumping.

A. Yes, it does.



BY MR. FRAWLEY - I understand there are some parts of the United States that regard Ontario and Quebec as their natural market?

A. Yes, of course there is. And if this continent were a continuity and there were no boundary lines, that would be the natural place. But it just does not happen to be that way. (Referring to Exhibit S/11) Of course it would be a natural market. Here is your coal field of Pennsylvania and there is where the coal mines first developed when the people after the Revolution came over the mountains and began to dig cellars to make themselves homes, and the first thing they got was coal. This other map will show the extent of that field running down through Pennsylvania and West Virginia, the Pittsburg seam there is the largest mineral deposit in the whole world.

Q. You would not call it surplus?

A. If we produced more meat in Canada and it is piling up and if it is surplus to the local demand, you are looking for an outlet. Things are sold if they are surplus at a cheap price. For example spouter that is produced in British Columbia I find I can buy on the London Exchange and bring it back to Halifax and land it at the Steel Plant here cheaper than you can buy it in British Columbia. It was surplus to Canada's requirements.

BY MR. FORSYTHE - You have to take the producing capacity of the United States and the consumption capacity.

A. Yes, that is what I say. Sometimes they produce more than they can consume and they want to get rid of the additional.

BY MR. FRAWLEY- It will have to be developed later, and this Commission has to consider that question, whether this coal is dumped on Ontario and Quebec from those mines.

A. One of the first things on the Agenda of the new Congress is the reenactment of the Bituminous Coal Act, and in that case there will be no dumping, if it is reenacted. Then a





buyer in Canada will have to pay the minimum code price, and that will obviate the dumping. I think that will be enacted soon. It was sent to the last Congress and turned down by 9 to 16.

BY MR. FORSYTHE - You still have dumping if it is pressure of coal?

A. Yes. They do not bank coal in the United States like we do. If they get surplus coal they look for a coal pedlar that will take the coal and ship it. If this pedlar or miner has a customer in Canada he offers it at the minimum less 12¢ per ton which they are permitted to give, and he will phone all over creation to move that coal to get it away from demurrage.

BY MR. FRAWLEY - You say if this Act is reenacted it will prevent dumping?

A. Yes, that is the most important thing that can happen to the Province of Nova Scotia.

Q. At the moment are there 2 prices for Pennsylvania coal, one at which they sell in the home market and one at which they sell in Canada?

A. The present prices are O.P.A. prices (Office of Prices Administration) in Washington. They find it necessary to put a ceiling on and they put a top price and you cannot sell for more, except the dealers in Canada have been permitted to plus that maximum by a few cents in order for them to do business.

BY MR. FORSYTHE - Beneath that ceiling O.P.A. you have varying prices?

A. Yes, when coal was plentiful, but at the moment there is a coal scarcity in the United States, there have been very heavy snowstorms which closed a lot of strip mines, and coal is in short supply at present. But if it gets plentiful they can sell, because if it gets surplus then O.P.A. prices will start to go down. So it is very important to this



Province and this industry to see that thing happen, which I believe it will.

BY COMMISSIONER McLAURIN - Even if that Act is enacted, we can have a surplus in the United States which in the eyes of the Canadian producer would appear to be dumping although it would be sold at the minimum price. It would not be dumping in the exact sense of the word, but it would be to the poor Canadian trying to sell coal.

A. It would not be because the Canadian will know exactly what the price he has to meet is, so it is not dumping.

Q. So that should not apply?

A. No, because dumping is when you sell goods below the market price.

BY MR. FRAWLEY - It is a very interesting thing and something that will take up a lot of time with this Commission. The boys in Toronto that are importing bituminous coal think they are as much entitled to do that as their brothers across the border.

MR. McLANDERS - When this War came along and Nova Scotia began to fade out of the picture they were just like vultures ready to fly down and take our customers away.

MR. McLANDERS (continues brief)

In the U.S.A. very little coal is sold on long term commitment, by which is meant a year or more. The business is mostly from month to month, which doubtless has much to do with the violent and sudden fluctuations in price so frequently encountered and so very disturbing to the Central Canadian Market situated as it is, and small in comparison with the great coal industry of the U.S.A.

The single stabilizing influence was the Bituminous Coal Act of 1937, now expired, but likely soon to be re-enacted. This keeps the market on something like an even keel and provides a guide to competitive conditions.





(b) COAL FROM OTHER PROVINCES

Coal produced in Alberta and Saskatchewan, the two Provinces producing a large enough tonnage to be a serious factor, has not to date penetrated eastward of Western and Northern Ontario and only in small amount. Future developments may bring the coal into Ontario in larger amount and if that happens it would seem advisable to zone the areas or limit the classes of business to be served by Western and Eastern coal to avoid one competing against the other.

(c) IMPORTS FROM OTHER COUNTRIES!

These can be best examined and discussed by dealing separately with Canada and Newfoundland.

Statement "C" shows imports into Canada.

Statement "D" shows imports into Newfoundland.

BY THE CHAIRMAN - There has never been any coal developed in Newfoundland?

A. A very little bit up around the Muskeg country.

MR. McLANDERS (Continues brief)

Imports into Canada were mainly from Great Britain and went mostly to the Maritime Provinces in fairly equal volume for bituminous and anthracite over the period 1931 to 1939. This is high grade coal and very acceptable for household use. Vessels coming in ballast from coal shipping ports of Britain prefer a pay load or part load of coal to taking on sand or gravel and will name very attractive rates. The combination of good coal and cheap transportation presents a tough competitive condition and short of some pretty drastic measure a certain tonnage of coal so transported is likely to move into Eastern Canada and the St. Lawrence. Many of the ships will come to carry Canadian wheat, lumber and other products, and shipping companies will feel entitled to carry a little coal as ballast. The market thus displaced would be very acceptable but it is not easy to suggest a remedy. Ships crossing the North Atlantic must carry ballast of some kind.



Canada has not yet had any bituminous and only comparatively small lots of anthracite from Russia but considerable mention has been made in coal trade circles of late regarding the possibility of imports of both anthracite and bituminous coals from Russia in post-war years. Both kinds are of excellent quality and their appearance in Canada would present a new kind of competition as the factors involved in the transaction would probably be of an indeterminate nature.

#### NEWFOUNDLAND

Newfoundland is regarded more or less as a natural market for Cape Breton coal lying as it does a short distance away and having many links with Canada. The fact is, however, that this market is an uncertain one and subject to intense competition from U.S.A. and European coals.

An examination of Statement "D" appended discloses a steady increase in U. K. imports from the low of 9,417 tons in 1927 to a high of 185,376 tons in 1937. In this same period Cape Breton exports dropped from 303,032 in 1927 to 97,181 in 1937. What is the reason for this change. Mainly one of transportation but not altogether unaffected by other considerations such as the formation of the Commission Government in Newfoundland under which Great Britain assumed certain financial obligations, and the depressed state of trade in Britain in the early '30s. The Mines were operating on short time and still there was a surplus of coal.

Now, with regard to the effect of transportation on the Newfoundland market, it is the desire for a two way haul. The Anglo-Newfoundland Development Company in Grand Falls, and Bowater's Paper Company in Cornerbrook, both large users of steam and domestic coal, sell the bulk of their products in the U.K. in peace time (they sell some in the United States too) and steamers coming out for paper bring coal at low rates in preference to coming in ballast. Part of the trade may be handled by the Company's own steamers, in which case it is natural for them to bring a load of





something they need in their plants. It is not always coal. Sometimes steamers coming to Canada for cargo will take coal to Newfoundland. The deviation is not great and a chance is afforded to earn something on the outward voyage.

During the War Newfoundland's consumption of coal has risen steadily until in 1944 they imported from all sources over 500,000 tons. The U.S.A. is now interested on account of the Air Fields, Naval and Military Stations which they have established in Newfoundland. Now Newfoundland taking so much coal is one reason why our coal has been drained away from here, but that is all a matter of Government policy.

The Newfoundland market will continue to be highly competitive and quite uncertain. It has been proposed that full autonomy within the Empire be restored to Newfoundland in which case they would be free to enter into Commercial Treaties and Conventions which might affect our exports of coal. Our best prospect of retaining a good share of this market lies in supplying coal of good preparation, giving unexcelled service and at a reasonable price level.

One item it may be well to mention and which may be termed an invisible import is bunker coal. In times of good trade when ships can get a full cargo of freight they come with minimum bunkers and take what is required for the outgoing voyage. When trade is depressed and only part cargo of revenue freight is offering, they will take on sufficient coal for a long period at a port where the price is lowest. In this way considerable tonnage is lost and generally at a time when it is most needed.

#### IMPORTATIONS OF COKE

For the past 10 years the importations of coke into Eastern Canada have fluctuated considerably. By far the largest amount of coke was produced from coal, but each year some petroleum coke also came in.

In Nova Scotia a small amount of American, English





and German coke was imported. The American coke was for foundry use.

In New Brunswick and Prince Edward Island a small amount of American foundry coke is imported each year for foundry use. For some years back no other foreign coke has entered these provinces.

In the Province of Quebec up until shortly before the war small amounts of coke manufactured from coal came in from Belgium, United States, Poland, Great Britain and Germany. Most of the coke from the United States was used in foundries and furnaces. The petroleum coke was used for the manufacture of electrodes in the Saguenay and Three Rivers Districts. Coke made from coal was used for lining of pots in the Aluminum industry.

By far the largest portion of imported coke came into the Province of Ontario and was used chiefly for domestic purposes, but quite a percentage found its way to foundries for various metallurgical processes.

The total imports east of Ontario, considering the use to which they were put, were not of sufficient volume to seriously interfere with the disposal of Nova Scotia coal.

## CHAPTER V

### FOREIGN IMPORTS

- (a) Sources of supply other than Canada
- (b) Nature and extent of foreign imports and location of Canadian markets supplied.
- (c) Comparative heat and other values in comparison with local product.
- (d) Costs of production.
- (e) Transportation rates, foreign fields to Canadian markets supplied - basis upon which established.
- (f)
- and (g) Customs duties, excise and exchange imposed and Anti-dumping regulations in force.



(a) SOURCES OF SUPPLY OTHER THAN CANADA

The principal source of supply of coal imported into Canada is from the U.S.A. This country is divided into what is termed 23 producing districts, the boundaries of which were determined by the National Bituminous Coal Act. The greater part of the tonnage imported into Canada comes from:-

District 1	Eastern Pennsylvania
2	Western Pennsylvania
3	Northwest Virginia
4	Ohio
7	Southern Low Volatile
8	Southern High Volatile

and a small amount from 6 Panhandle, West Virginia.

These are the principal areas from which coal comes to Canada. There is some from Western Kentucky.

By far the largest part of the tonnage comes from Ohio, Pennsylvania, West Virginia and Eastern Kentucky.

No. 8 is the extension of the Pittsburg seam in Ohio. As a matter of fact the Pittsburg seam produces coal of so many characteristics that you can hardly enumerate them. The Hawking Valley is right down there (pointing it out on S/11.)

The amount of coal imported from Britain and other Continental Countries is at present nil and in ordinary times comparatively small. It has been dealt with in Chapter IV.

(b) NATURE AND EXTENT OF FOREIGN IMPORTS AND LOCATION OF CANADIAN MARKETS SUPPLIED.

Statement "I" shows the imports of foreign coal into Canada. By far the largest part of the tonnage is from the Province of Ontario and Quebec which averaged for the 20 years ending 1939, 12,000,000 tons yearly and of this quantity about 75% went into Ontario.

To appreciate the development of imports from various producing districts in the United States it is well to keep in mind that the coal industry sprang up round





about the Pittsburg area and in Ohio and it was from these Districts that coal began first to move into Ontario.

It is hard to think that something that happened 40 years ago is affecting coal today. Around Pittsburg and Ohio is where the industry first began to develop and where the industry plants of Western Ontario got their coal from. The equipment that was built for those plants in Ontario was built to burn that coal, and that is why we have so much difficulty in getting into a great many of these places.

Now a significant thing, and one which has an important bearing on the marketing of Nova Scotia coal in Ontario, is that the first coal producing area to rapidly develop in U. S. A. was in the Pittsburg area and this was the source from which the manufacturing industry of Ontario first got its coal supply of excellent quality and high fusion ash. Their equipment was designed for this quality of coal and this is the reason, along with the fact that many plants have expanded their operations requiring the combustion equipment to carry a higher load than that for which originally it was designed, that great difficulty is experienced in introducing Nova Scotia coal into such plants. In fact, there are many of them which positively cannot burn Canadian coal or Nova Scotia coal until such time as the old equipment is replaced by modern equipment of a design suitable for the lower fusion coal.

Our coal has a fusion temperature of ash as low as 1950 and in coking over 2050. However, from Acadia it is a little higher, and Springhill might be 50 degrees higher than Dominion, and there is nothing that any man can do to change that.

BY MR. FRAWLEY - And the Pittsburg would run about what?

A. It varies according to the district, in some places it goes as high as 2800 and 2900.

BY MR. BROWN - It would run probably 2300 or 2400. Some is as low as 2100.



As new fields were opened up in the United States, coal from these fields began to enter Canada, e. g., the Fairmont field in West Virginia. Coal from this field is so similar to Dominion coal in its appearance, its analysis and in its burning characteristics that it might be termed almost perfectly interchangeable. It is coal from this District with which Nova Scotia coal often has to compete. That is the coal coming from the Fairmont field.

The modern tendency has not been to build equipment for specialized coals but to build equipment which is capable of burning all classes of coal down to the lowest grade. This gives the purchaser a greater range of fuels from which he may choose and is of great advantage to Nova Scotia coal. There are many equipments which will be replaced in Ontario within a short period of time and every effort that can be made by industry and by the Government of the country should be put forth to see that equipment is installed suitable for the burning of Nova Scotia coal; even if the coal is not available at certain times no harm will be done since there will always be plenty of similar coal available in U.S.A. However, the tendency has been of late years to get away from the use of specialized coals because the buyer has realized that he oftentimes has to pay quite a premium for preferred coals and his choice is always limited.

Districts 7 and 8 located in Eastern Kentucky and Southwest Virginia supply large quantities of coal to Canada, notably in the domestic field. The Pocahontas and Island Creek coals, along with many similar producers in the Eastern Kentucky field, are the principal suppliers. This coal is popular in Ontario.

To summarize, the coals coming from the U.S.A. and distributed from the Head of the Lakes to the Saguenay originate in No. 8 Ohio, Cambridge and Hocking districts of Ohio; Freeport, Butler-Mercer, Sutton, Stoneboro,



Pittsburg, Clearfield and Connellsville districts of Pennsylvania; Fairmont, Cumberland-Piedmont, Kanawha and Pocahontas in West Virginia; and from Eastern Kentucky.

Details of the tonnages imported down to individual mines is on file in the Coal Controller's Department, Ottawa.

It should be mentioned that for the past two years about one and one-half million tons of coal a year has been coming into Canada from Western Kentucky (very different coal to Eastern Kentucky) and Illinois, for railway use. This is definitely a war emergency movement and will disappear after the war.

(Page 151 follows).





(c) COMPARATIVE HEAT AND OTHER VALUES IN COMPARISON  
WITH LOCAL PRODUCT

There are many classes and kinds of coal in the United States. That country has been favoured with the most extensive and varied coal deposits of any country in history. There is a range of coals to meet every need, fusion temperature ranging from 2000 degrees to 3000 degrees, ash content from 2% to 15% or more. They have low volatile coal, medium volatile coal and a great range of high volatile coals; coals with sulphur ranging from less than 1% up to 7% or more.

I might say that very few coals in the United States would go as high as 7%;  $4\frac{1}{2}$  to 5 would be regarded as very high down there.

It has already been mentioned that the coal most nearly comparable to Dominion coal is that produced extensively from the Pittsburgh seam in the Fairmont field. This is by far the greatest single producing seam in the United States and is the one from which comes the great proportion of the steam coal, and coal for other uses, imported into the country. A typical analysis of Fairmont coal can be placed alongside that of Dominion coal and there is scarcely any difference. However, analysis does not tell the whole story. Certain coals in burning release their energy more rapidly and completely than others and there are other considerations such as the nature of the constituents of the ash having an effect upon the extent and nature of the clinker, the caking and swelling qualities or contracting qualities, etc., etc. In modern plants equipped with either stokers or pulverizing equipment the physical qualities very often give results quite different to what might be expected from the chemical analysis.

There is only one sure way to determine relative heat value and suitability of different coals and that is by actual test under operating conditions. The lbs. of steam per lb. of coal in relation to the cost of the coal and cost of maintenance tells the story. Laboratory tests simulating operating



conditions are useful as a guide, but are not positively dependable or conclusive.

All in all, from the experience gained in the marketing of large tonnages of Fairmont coal it can be safely stated that Dominion coal is the equal of any of the Fairmont coals, and possibly slightly superior in quality to some of them.

Below is listed representative analysis of these two coals from which it can be seen how close they are analytically:

<u>Dominion</u>			<u>Fairmont</u>	
1.5% - 2%		Moisture	1.5% - 2%	
33. - 35		Volatile Matter	37.	
55. - 58		Fixed Carbon	53.	
8. - 9		Ash	8.	
2.5 - 3		Sulphur	2.	
13,850		(B.T.U.'s (Dry Basis)	13,900	
2050° - 2150°F.		F.T.A.	2050° - 2150°F.	

There are many coals all higher in heat units, less sulphur, less ash, and there is such a range of these that it is impossible to list them without occupying too much space, e.g., Island Creek coal, a popular fuel in Ontario, has an analysis approximately as follows:-

Moisture	1 %
Volatile Matter	38. - 39.
Fixed Carbon	55. - 56.
Ash	5. - 6.
Sulphur	1. - 1.25
B.T.U.'s (Dry Basis)	14,300 - 14,500
F.T.A.	2500° - 2600°F.

and, of course, is a superior coal from the standpoint of heat units, low sulphur and ash.

BY MR. FRAWLEY: What is F.T.A.?

A Fusion Temperature of Ash. Representative analysis of coal from the Eastern Kentucky Big Sandy District, Elkhorn Seam, is:

Moisture	2% - 2.5%
Volatile Matter	39.
Fixed Carbon	56.
Ash	4. - 5.
Sulphur	.75 - 1.
B.T.U.'s (Dry Basis)	14,750 - 15,000
F.T.A.	2400° - 2500°F.

This coal, too, is superior in heat value, is of firm structure, low ash, low sulphur, and one might go on listing coals from many districts in the United States but any attempt to evaluate comparative heat values of coal is very difficult because so





much depends upon the nature of the coal itself, the type of equipment in which it is burned and the conditions under which the equipment is called upon to operate. It is generally accepted that there is a range of about 75 cents per ton between the ordinary coals such as Fairmont and the very high grade Southern coals and some Pennsylvania coals.

Now I wrote that 75 cents in after consultation with many people of long years experience. I talked to Mr. Brown, who is here, and he is inclined to think that that may be a little on the high side.

BY THE CHAIRMAN: Who is Mr. Brown? Give us his qualifications.

A Mr. Brown is a consulting engineer.

Q Having special qualifications?

A Oh, many years' experience in coke and coal and by-product work.

BY MR. FRAWLEY: What does Mr. Brown say?

MR. BROWN: Nearer 50 cents rather than 75.

MR. MACLANDERS: Of course there are many items which enter into this valuation and you would be in a better position than anyone else to say it.

MR. BROWN: Of course if delivered price were considered it might be close to 75.

MR. MACLANDERS: Well, shall we say 50 to 75?

MR. BROWN: Fair enough.

MR. MACLANDERS: All the analyses mentioned of U.S.A. coal in this chapter are taken from the analyses submitted by the producers to the National Bituminous Coal Act after it was established in 1937. There is in process of preparation a new book on analyses of U.S.A. coals which will be available for distribution in about a month's time and would be a good record for anyone wishing to make comparison of heat value from the standpoint of analytical determinations.

BY COMMISSIONER MORRISON: Who is publishing that book?

MR. MACLANDERS: A fellow MacQueen or McEwan in Pittsburgh. For our own information hundreds of samples of coal



from various seams and mines in U.S.A. have been analysed by reputable chemists and will be kept on file for future reference as a check against the quality of coal with which Nova Scotia coal will have to compete.

GRINDABILITY INDICES OF TYPICAL CANADIAN AND OTHER COALS

It is to be noted that the grindability tests referred to hereafter were made by the Hardgrove-machine method and this method was developed by a commercial firm which manufactures and installs pulverized fuel boiler installations. As for the relation between grindability and pulverizing capacity, the originator of this method, after studying the results of tests in a large number of different sizes of pulverizers has stated that pulverizer capacity is proportional to grindability up to about 60 grindability index but falls off at the higher grindabilities. This should be borne in mind when interpreting the results for the softer coals showing the softer coals showing the higher grindability indices.

The grindability indices tabulated below are determined by the A.S.T.M. Hardgrove-machine method and for various coals grouped according to rank and geographical source:-

Geographical Source and Rank Classification	Number of Samples	Range of Grindability Indices by Revised Calculation Formula
<u>Anthracites</u>		
Pennsylvanian ... (anthracite)	4	29, 31, 32 & 52
French Indo-China .. (anthracite)	2	34 & 35
Russian ..... (anthracite)	2	34 & 34
Welsh... (anthracite & semi-anthracite)	9	48 to 58
Westphalian (anthracite & semi-anthracite)	4	54, 54, 55 & 62
<u>Low &amp; Medium Volatile Bituminous</u>		
Pa. & W. Va.... (Low Volatile Bit.)	4	98, 98, 100 & 107
Pa..... (Med. " " )	2	76 & 101
Alta. & B.C.... ( " " " )	7	75 to 102
N.S.-Westville ( " " " )	5	73 to 84





High Volatile A Bituminous

N.S.-Springhill area (Cumberland Co.)	9	71 to 103
N.S.-Sydney area (Glace Bay District)	20	61 to 81
N.S.-Sydney area (Sydney Mines District)	13	61 to 78
N.S.-Inverness area (All Districts)	14	58 to 71
N.S.-River Herbert area (Cumberland Co.)	7	66 to 76
N.S.-Pictou area (Stellarton District)	13	58 to 81
N.S.-Pictou area (Thorburn District)	4	57 to 62
N.B.-Minto area (All Districts)	19	65 to 91
B.C.-Telkwa area & Vancouver Island	7	71 to 83
Pa. & Ohio-miscellaneous	18	61 to 76

High Volatile B & C Bituminous

Alta. & B.C. - miscellaneous	6	46 to 63
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Sub-bituminous B

Alta. & B.C.-miscellaneous	4	39 to 45
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Lignite

Saskatchewan & Northern Ontario	2	54 & 49
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MR. FORSYTH: I think you might point out just where you locate the Nova Scotia coal.

MR. MACLANDERS: Nova Scotia coal has quite a favorable grindability index. Take the Pocahontas at about 100 as being standard or the desirable thing, and others are related to that grindability. Now ours is somewhere around 68 to 70, so that we have quite a good grindability. Western coals you will notice are quite firm and hard. Coal is like many other things; you can't have everything bound up in it. The fact that your coal is soft is often an advantage, from the standpoint of grindability, but not in having it stand up in storage or transportation by ships or standing on docks; it breaks up too easily.

It will be noted that the range is rather wide between the minimum and maximum. It has been found from experience that the average grindability of Dominion coals is 68 to 70, which compares favorably with most of the Pittsburgh seam coals, particularly the Fairmont coals which form such a large part of importations.

As far as results of tests are concerned, Dominion coal and Pittsburgh seam coals, particularly Fairmont coal, appear comparable; however, in practice, many concerns operating large plants using pulverized fuel prefer Dominion coal to Pittsburgh





coal from a grindability standpoint.

Although the grindability of a coal seems to be predictable as being within a certain range, through a knowledge of the source, rank and grade of the coal, it appears to be necessary to make an actual grindability determination when detailed and exact information is desired in connection with the operation of a particular plant.

(a) COST OF PRODUCTION

The latest complete year for which official information is available on the cost of mining bituminous coal in the U.S.A. for mines of daily capacity of 50 tons or more in 1942. The information covers Commercial and Captive Mines and all methods of mining. The cost is shown as \$2.266 per ton. I may say since writing this brief I received information showing that the cost for the first six months of 1944 was \$2.52.

MR. FRAWLEY: Could you have a breakdown of that?

MR. MacLANDERS: I think it is in the statements there that are filed.

MR. FRAWLEY: The breakdown is in statement "L" in Exhibit S/7.

MR. MacLANDERS: Since that year there has been a wage increase of approximately \$1.50 per day reflected in costs by approximately 20 cents per ton. A like increase in wages in Dominion Coal Company mines would be reflected in increased cost by approximately \$1.25 per ton. However, it is to be noted that the increase in wages in U.S.A. in 1943 has been offset to some extent by greater production in tons per man. In 1943, 33,991 less miners than 1942 produced over 6,000,000 tons more coal than in 1942; in 1944, figures of production just to hand indicate a total of 621,000,000 tons for the calendar year or a production increase of 5.2% over 1943 despite a mine man-power drop of 7.2%.

Tons per man in 1943 is reported as 5.25 but it should be noted that tons per man in the West Virginia field, from where much competition comes, was higher than the average for



the industry, being for the first six months of 1944 as reported by State of West Virginia Department of Mines 6.96 tons per man; machine operations 7.21 tons per man, hand mines 5.65 tons per man and stripping operations 17.87 tons per man.

However, in examining these figures more closely it will be found that in the Counties of Monongalia, Marion and Harrison, from whence comes the great proportion of steam coal imported from West Virginia, the tons per man are considerably higher because most of the coal is won by machine mining, e.g., in Monongalia the tons per man for first six months of 1944 was 8.39, Marion 7.3 and Harrison 7.3. These figures do not include stripping operations.

The exceptionally favorable mining conditions in this field and in others make possible the production of coal at very low cost. Nowhere in Nova Scotia is it possible to even approximate these favorable conditions. They just do not exist. This has got to be realized just as it must be appreciated that Nova Scotia coal is of low fusion temperature and nothing man can do will change it.

In passing, it may be well to mention that there has been a steady upward trend in tons per man since 1890 with the exception of one period 1932-1938.

MR. FORSYTH: You are referring to the United States?

MR. MACLANDERS: Yes, there is a chart in Exhibit S/7 showing that. If this trend continues it may be expected that stiffer competition will be met unless there are other compensating factors.

Now what follows is rather dry, but it was felt necessary in order to give you a picture of freight rates in the United States.

(e) FREIGHT RATES - FOREIGN FIELDS TO CANADIAN MARKET

The rates used in the movement of coal from United States to Canada are the published tariff rates of the various Railways handling coal.





The rates named in these tariffs are the rates applicable to all traffic from the respective producing fields and no individual company or group of companies can secure any lower basis of rates than that applicable from the respective origin district as named in these tariffs, so that there would be no possibility of any dumping by way of reduced freight rates.

Speaking of coal imported to Canada by way of Lake Erie ports in the United States and thence by boat, some fifty or more years ago this traffic consisted almost entirely of coal from the Ohio No. 8 district lying in south-eastern Ohio, and from the Pittsburgh district lying just east of the Ohio No. 8 district. As development of the Fairmont field in Northern West Virginia progressed, considerable coal was shipped from that field.

The base rates, to which all other Lake Erie coal rates are related, are the rates from the Ohio No. 8 and the Pittsburgh district, which presently are \$1.53 and \$1.56 per ton respectively. It was decided to accord the Fairmont districts a 20 cents differential over the Pittsburgh district, making the Fairmont district rate presently \$1.76. All rates named are exclusive of the dumping charge which is uniformly 9 cents per ton.

The rates from the districts other than the two base groups mentioned were established originally by agreement between Railroads serving those fields and the producer, taking into account the cost of production and the quality of the coal in the respective fields, the purpose being to allow each of the fields to equitably participate in the Lake traffic.

There is also another producing district in Ohio known as the Hocking field, lying in southern Ohio south-west of the Ohio No. 8 field. Coal from the Hocking field is not much of a factor in exporting to Canada but it takes the same rate as the Ohio No. 8 field.

As production developed in the south-eastern Kentucky and southern West Virginia fields, in order to enable those fields to compete in Lake traffic on an equitable basis with the Ohio,



Pittsburgh and Fairmont fields, rates were established from the high volatile section of the Kentucky and West Virginia fields on a basis of 28 cents per ton higher than the Ohio No. 8, or 25 cents higher than Pittsburgh. Later these differentials were increased 10 cents, making them 38 cents and 35 cents over Ohio No. 8 and Pittsburgh respectively. The rates from the Pocahontas fields in Kentucky and West Virginia were established on a basis 15 cents per ton higher than the high volatile fields just mentioned.

This structure of rates has been attacked by various United States coal interests on numerous occasions during the past fifty years and has been reviewed each time by the Interstate Commerce Commission and a few small changes were made but the figures given above represent the competitive situation between these various fields today. While distance was a factor in establishing these rates, it was not the principal factor as the main factor was the desire of the Railways to accord each of the producing fields, and themselves, an entrance into the Lake market on an equitable basis considering costs of production and quality of the coals.

The operating conditions on the Railroads between the mining fields and the Lake ports such as, for instance, their ability to handle coal in trainload lots, the availability of return load for the empty cars after they were unloaded at Lake ports, were also given serious consideration in the establishment of these differentials.

The proceedings before the Interstate Commerce Commission in which these rates were reviewed time and again are matters of public record and are available in Washington to anyone with a legitimate reason for examining them.

The rates to Lake Ontario ports from the Pittsburgh district and Fairmont district were established on the same principle, that is, fixed differentials over or under the origin group as was used in developing the rate structure to Lake Erie ports.





Other less extensive groups such as the Butler-Mercer (that is north of Pittsburgh), Westmoreland (that is east) and Connellsville, were differentially related to Pittsburgh.

The rates to Lake Ontario ports were originally made by the publication from the Reynoldsville group to Charlotte of a rate 12 cents higher than the rate from the Pittsburgh group to Lake Erie ports. This was followed by according the Clearfield group the same rate as the Reynoldsville group and by differentially relating the other groups such as Butler-Mercer, Pittsburgh, Westmoreland, Fairmont, etc., to the Reynoldsville base group.

The whole thing was to get a balanced freight rate, a relativity, so that no field had an advantage over the other. They balanced out the whole thing with the idea of giving work to all coalfields so as not to have, say A, working full-time and field B working half-time.

BY COMMISSIONER MORRISON: Table 2, are those the rates in effect today?

MR. MACLANDERS: Yes, those are the rates today. Following is a general portrayal of this situation in more detail:-

(1) Rail Rates from Mines in United States to Eastern Canada

The rate structure is based on a system of using the Clearfield district in Pennsylvania as the base group and relating the other districts such as Westmoreland, Greensburg, Pittsburgh, Fairmont and Cumberland-Piedmont districts on a system of differentials over the Clearfield district as the base rate. For example, some group rates to Montreal are:-

Clearfield group	\$4.11	per	ton	plus	equalization
Greensburg "	4.24	"	"	"	"
Pittsburgh "	4.33	"	"	"	"
Westmoreland "	4.33	"	"	"	"
Connellsville "	4.33	"	"	"	"
Cumberland-Piedmont group	4.33	"	"	"	"
Gawley "	4.46	"	"	"	"

BY COMMISSIONER MORRISON: What is that plus?

MR. MACLANDERS: Equalization is 22 cents per ton and that is the exchange on the American portion of the freight rate.





Instead of paying exchange you pay equalization and that appears on the freight bill issued by the originating road in the United States. It is 22 cents irrespective of where the coal comes from, 22 cents per gross ton or 20 cents net ton. It is just exchange in another form. Now the Gawley rate you will notice is a little higher; that is because it lies down below the district.

- (2) All Rail Rates from United States Mines to Ontario Points to which the natural gateway would be Niagara frontier

On this movement the same principle of establishing a base origin group and relating other producing districts to them was followed. In this case the Pittsburgh district was used as the base group and the rates from the other producing district were related on a system of differentials over or under the Pittsburgh base group.

- (3) Advantages of Rate Structure based on fairly large Origin Groups and System of Differentials for other Origin Groups over or under Base Group

Under this system of making freight rates the purchaser has the advantage of the selection of coal from a large number of mines in a given origin group all taking the same freight rate. On the other page there are six different rates. There are hundreds of mines within those rates. Someone calls my office in Montreal and offers coal and I say, "What does it move on?" "Moves on the Westmoreland rate or Cumberland-Piedmont." We know right away what it is and that is all that passes between you.

These origin groups in many instances have a variation of mileage between the nearest mine to a given destination and the most distant mine of as much as 200 miles and, in a few instances, 250 miles. By relating to such base origin groups the rates from other origin groups on a system of differentials in cents per ton, a purchaser has the advantage of the coal produced in an entire region such as Western Pennsylvania and Northwest Virginia, Ohio, Kentucky and Southern West Virginia on a compact rate structure so that not more than six or eight differ-



ent freight rates have to be considered in determining the wisdom of buying from one or the other mine in this vast region, taking fuel value and adaptability of the coal to a given purpose into account.

If a strict mileage system were used there would be, in some instances, thousands of rates to a given destination because each mine, or almost each mine, would have a separate freight rate, but under the differential system this same destination may have only six or eight rates to consider covering the entire field of these thousands of mines.

There is, of course, a distinct advantage to the coal producing companies, and also the purchaser, in the group differential system of rates as compared with mileage system because under the mileage system the mines having the shortest distance would have the lowest rates and the demand for their coal would far exceed the demand from the mines most distantly located, and you would have an upset of employment at your mines.

Generally speaking, the rates from United States mines to Ontario and Quebec destinations are made by the use of the rate from the mines to either the Niagara Frontier or Detroit plus the rates from those gateways to the destination. It is a little different there, you see. Coal that comes in from the United States up this way to Quebec moves on those rates just mentioned--Pittsburgh, Westmoreland, Clearfield, etc. Now then, when it comes to coal moving into Ontario they come up here to the Niagara Peninsula and then thence on a rate named by the Canadian railways. In other words there is not a through rate, except in one or two instances. There is a through rate to Port Burwell for coal for the Canadian National Railways; that is one that I happen to know.

There are, however, some scattering exceptions in the case of a few destinations in Ontario to which joint through rates are in effect from the mines.

Contrasted with the situation just described is the fact that there is a quite complete line of through rates published





from the mines to final destinations in Eastern Canada, roughly speaking, lying in the area east of a line drawn north and south from Prescott through Ottawa inclusive.

Statement "F" appended shows some representative freight rates applicable to U.S.A. coal for importation to Canada, also some local hauls within the U.S.A., and freight rates applicable to Nova Scotia coal on long and short hauls. The mileage and rate per ton mile is also shown for the purpose of providing a comparison of the relative cost of hauling coal in the two countries.

#### WATER TRANSPORTATION RATES

Present water transportation rates from U.S.A. ports on Lake Ontario and Lake Erie to Canadian destinations from the head of the Great Lakes to Dalhousie, N.B., and to Cornerbrook, Newfoundland, were established by The Canadian Shipping Board, May 16th, 1942, vide W.P. & T.B. Order 133.

In normal times rates are not fixed and fluctuate according to volume of tonnage and other conditions such as return haul of other commodities. They are usually agreed upon, for a stated period, between the steamship companies and shippers.

For purposes of comparison the following tabulation shows the present established rates and those paid by regular importers in 1939 for movement of coal to key points:-

	<u>Rate per Net Ton</u>	
	<u>1944</u>	<u>1939</u>
From Lake Ontario Ports		
to		
Chicoutimi	\$1.35	\$1.00
Quebec	1.20	.80
Three Rivers	1.10	.75
Montreal	1.00	.70



From Lake Erie Ports	<u>1944</u>	<u>1938</u>
to		
Chicoutimi	\$1.65	\$1.15
Quebec	1.50	.95
Three Rivers	1.40	.90
Montreal	1.30	.85
Toronto (Self-Unloaders)	.60	.50
Georgian Bay Ports	.55	.40

FOREIGN IMPORTS

(f & g) CUSTOMS DUTIES, EXCISE AND SALES TAX IMPOSED, IF ANY

In order to show the relative effect of duty, taxes, exchange, etc., as applied before the war and at the present the following tabulation is made for the years 1938 and 1944.

For Bituminous Coal Imported from the United States

	<u>1938</u>	<u>1944</u>
Duty	75c per net ton	75 c per net ton
Excise	3%	10% on value of coal at mine converted into Canadian funds
Sales Tax (federal)	Nil	Nil
Exchange	Nil	11%
Equalization charge on Rail Freight	Nil	22c per net ton

The equalization charge on rail freight is a uniform charge made by the Railways of the United States on all exports to Canada moving all rail from mines to destination in lieu of the exchange of 11%. It really is in effect the exchange on the freight, but it is described as an equalization charge.

The excise tax of 3% expired in April 1939 at the time of the Trade Agreement between Canada and the United States signed at Washington November 17th, 1938. It will be seen from the above tabulation the effect that the excise tax and exchange has had on the delivered price of U.S. Coal. Taking slack coal at \$2.35 at the mines when moving via the lakes or all rail these charges amount to approximately 75c per ton.



The duty of 75c per ton on U. S. coal has been in effect since June 2nd, 1931, before that date it was 50c per net ton.

Regarding anti-dumping legislation, during the short period from March 12th, 1931 to June 1st, 1931, Order-in-Council P.C. 584 fixed the value for duty on Bituminous Coal at \$1.00 per net ton for slack and \$1.25 per net ton for R/Mine.

The duty on coal from the United Kingdom was 35c per net ton for many years; this rate was in effect until December 1940 when coal from the United Kingdom was admitted "free" under the War Exchange Conservation Act.

MR. FR. WLEY: Do you mean to say that you have no protection now from dumping?

A No sir, none that I know of, and I am quite sure we would be acquainted with it if it existed.

BY MR. FORSYTH: Isn't there some other provision about the exemption from duty for bituminous coal used in the manufacture of export goods?

A Well, I mention that in a brief.

Q Where did you find it, in the Tariff or ---?

A It is under draw-back on duties.

Q I was wondering whether for purposes of convenience of reference you could indicate where it could be found in the law. The Customs Tariff Act, I presume it is?

A It has been in effect for many years, just as there is a draw-back on ship's stores loaded aboard a ship at Halifax or Saint John, the ship going foreign. There is a lot of red tape in connection with it and it is a thing extremely difficult to get accurate figures on.

Q We will look that up and see if we can't get a reference on it.

MR. MACLENDERS: The following drawback items applicable to Bituminous Coal are published in the Customs Tariff.





<u>Tariff Item</u>		Portion of duty payable as drawback
1019	Bituminous Coal (April 7, 1914, Memo. 1792 B.)	When imported by proprietors of coke ovens and converted at their coke ovens into coke for use in the smelting of metals from ores and in the melting of metals 99 p.c.
1049	Bituminous Coal, imported on or after March 23rd, 1935. (April 26, 1939, Memo. D-47-17)	(a) When converted into coke to be sold (b) When converted into coke to be sold: provided that not less than thirty-five per centum, by weight, of the bituminous coal so used, as covered by each drawback claim, was mined in Canada. 99 p.c.
1065	Bituminous Coal. (Feb. 17, 1928, Memo. 87, Supplement A.)	When used in melting, evaporating, and preparing salt produced in Canada: provided that no draw-back under this item shall be payable on coal used in producing salt or brine when such salt or brine is further manufactured than salt enumerated in tariff items 40, 41, 42 and 42a. 99 p.c.
1066	Bituminous Coal (Feb. 17, 1938, Memo. 87, Supplement A.)	When pulverized by proprietors of rolling mills for heating iron or steel for use only in the production of rolled iron or steel at their rolling mills. 99 p.c.
1070	Bituminous Coal entered for consumption ex-warehouse on or after April 1, 1942. (Order in Council under the War Measures Act, July 20, 1942. Memo D. No. 119. Amended by P.C. 7731, October 7, 1943)	When converted into coke to be sold: provided that to the satisfaction of the Coal Administrator the maximum quantity of Canadian mined coal which can be transported to coking plants operating under the benefit of Order in Council P.C. 3637 is included in the bituminous coal so used as covered by each drawback claim. Provided also that drawback under this item is in lieu of drawback under any other item 99 p.c.

Bituminous Coal since April 1st, 1944 (Tariff Item 588 C) has been admitted "free" of duty when imported by manufacturers of synthetic rubber.

For Anthracite Coal

Anthracite coal from the United Kingdom is admitted duty free.



On United States coal the duty is 50c per net ton, this rate has been in effect since October 13th, 1932. On sizes smaller than Barley the duty is 75c per ton.

The reason for that is that Barley is a very small size of anthracite and competes with <sup>bituminous</sup> slack and that is why representations were made to have the duty increased on that size of coal.

BY THE CHAIRMAN: That is one of the big objections that our friends from Ontario take to the duties generally, and I think they have a good case there.

MR. MACLANDERS: From their standpoint, yes, but not from ours.

MR. FORSYTH: Wasn't the duty on anthracite coal tied in with the Imperial Conference arrangements with respect to the importation of British anthracite?

MR. MACLANDERS: Oh yes. Since January 1st, 1942, anthracite when imported into a sea, lake or river port of the Province of Prince Edward Island, New Brunswick and Nova Scotia has been exempt from customs duty.

MR. FRAWLEY: Why is that?

MR. MACLANDERS: Well, there have been some easements in the duty on domestic fuel in the past few years in order to maintain the selling price. Every person gets their domestic coal, every householder, church, hospital and certain institutions get their coal for what they paid during the basic period between September 15 and October 11, 1941, and this remission of duty was made in order to keep down the price. In other words so that the Government would not have to pay out so much money in subsidies.

MR. FRAWLEY: Our ceilings don't apply to anthracite producers in the United States?

MR. MACLANDERS: No. American anthracite Buckwheat coal number 3 (Barley) was transferred from customs tariff item 588 duty of 75c per net ton to item 586 50c per net ton June 1st, 1944. The war tax was also cancelled.





The war tax of 10% on the value of the coal at the mine converted into Canadian funds is applicable to anthracite coal.

At the present time there is a provincial sales tax in the Province of Quebec of 2% and in the City of Montreal there is an additional local sales tax of 2%.

These taxes do not apply on sales to the railways, schools, religious institutions, provincial or municipal buildings.

## CHAPTER VI

### BUNKERS

In this, as in the last war, the demand for coal as bunkers at Eastern Canadian Ports has increased each year and is now almost double the pre-war level.

Volume of shipping through Halifax has so greatly increased that bunkers there have multiplied ten times. This abnormal demand presented a problem in supplying and handling - in August 1941 Government Departments interested in transport and the Naval Department informed the Dominion Coal Company of anticipated traffic through Halifax and requested that provision be made to bunker 25 vessels in 24 hours. To do this meant the acquisition of the property known as Pier 9, the purchase, dismantling, transportation to Halifax and re-erection of a large travelling bridge situated on a dock in Montreal. The work began the end of September and on December 1, 1941, the bridge commenced operation in conjunction with barges which also had to be acquired, and since that time no delay has occurred in handling bunkerings in Halifax harbour.

In May 1941 a decision was made by the Ministry of War Transport to import Welsh coal for bunker and this continued until 1943 when the Welsh was displaced by U.S.A coal imported under Lease-Lend arrangement.

In normal times bunker business is uncertain and the volume depends on the state of trade. When trade is brisk and full cargoes of revenue freight are offering, the volume of



bunker business is at a maximum, but when depressed conditions of trade develop the bunker business falls off for two reasons, first, there are fewer ships on the seas and, secondly, many of them will not have a full cargo and will take on bunker coal to maximum capacity at ports where the lowest price prevails.

In recent years there has been a trend to oil-burning ships. Of a total world tonnage of about 65,000,000 in 1914, 40,000,000 was coal-burning.

It is not permissible to state the tonnage now afloat--that is for the United Nations--but percentages can be given which confirm this trend to oil.

Of all shipping now directed by W.S.A., Washington, 2% are coal burners, remainder oil. The Canadian Park vessels are 75% coal, 25% oil.

Tramp steamers, many of old design, are 75% coal, 25% oil.

90% of all liners are oil, 10% coal.

Ships of the Scandinavian countries are 35% coal, 65% oil.

Greek, Yugo-Slavian and other odds and ends are 75% coal, 25% oil. These are nearly all old ships.

In Statement "H" oil consumption in Eastern Canada, bunkering shows a steady decrease from the equivalent of 490,584 tons of coal in 1933 to 1,187,000 tons in 1940 and the trend is not likely to end unless a more economical and satisfactory way of burning coal in ships' combustion equipment is found.

Controversy on Coal versus Oil firing in marine boilers has been going on for quite a number of years and there is little doubt that efficient and reliable methods of mechanical coal firing under marine boilers must be regarded as a prime requisite for the re-establishment of coal firing in fields now lost to oil firing.

British manufacturers have had some success with marine type stokers.



It is interesting to note that in the last two or three years before the war pulverized coal firing was finding increased application in German and Russian vessels. In a boiler plant of a German vessel equipped for pulverized coal firing there were four LaMont boilers of the circulating type, each boiler being laid out for a normal rate of evaporation of 22,000 lbs. of steam per hour.

As soon as the war ends and research and experimental work is resumed, one may expect to see progress made in the application of pulverized fuel to marine boilers.

4.30 P.M. - SESSION ADJOURNED UNTIL  
10.00 A.M., JANUARY 18.





- Vol. 3 -

ROYAL COMMISSION ON COAL

Sydney, N. S., January 18th, 1945.

Third Day.

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WITNESSES

T. S. McLanders - Pages 171 to 234.

C. W. Appleton - Pages 235 to 256.

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EXHIBITS INTRODUCED

S/14 - Map Showing Plants and combustion  
equipment unsuitable for Dominion  
Coal.

- - - - -

AUG 2 1946



SYDNEY, N. S., THURSDAY, JANUARY 18th, 1945 - 10:00 A.M.

MR. T. S. McLANDERS proceeds with the reading of Brief S/6

CHAPTER VII

HYDRO POWER SURPLUS ENERGY

Competition from Surplus Hydro Electric Power

Note: 1,000,000 H.P. of Hydro Power equals approximately 900,000 tons of coal when used for steam raising purposes.

This competition is already here. Curtailments and cancellations of coal orders began to come in early in November 1944, and, beyond question, very heavy loss of coal tonnage in the Province of Quebec will soon be felt and much more so during the next coal contract season beginning May 1st, 1945, and ending April 30th, 1946.

The following statistics received from the office of the Power Controller for Canada show the increase in H.P. installations for Hydro Units in Canada with particular emphasis on Quebec and Ontario.

Water Power Turbine Installation in Thousands of Horse Power

	<u>1938</u>	<u>1939</u>	<u>1940</u>	<u>1941</u>	<u>1942</u>	<u>1943</u>
Quebec	4,031	4.084	4.320	4.556	4.839	5.847
Ontario	2.582	2.596	2.597	2.617	2.684	2.673
All Canada	8.190	8.289	8.584	8.845	9.225	10.214

It can be seen from this table that upwards of 2,000,000 H.P. has been installed the last four years and of this quantity over 1,762,000 H.P. is in the Province of Quebec. (Ontario will be dealt with later in this article).

The new installations in Quebec are as follows:

Shipshaw Aluminum Co., Saguenay District	1,200,000 H.P.
St. Maurice Power Corp., St. Maurice River,	
La Tuque	225,000 H.P.
Beauharnois Power Corp., owned in Quebec Province	212,000 H.P.
Shawinigan Water & Power Corp., Rapide Blanc	40,000 H.P.
Quebec Power Comm., Upper Ottawa River	48,000 H.P.
Various small installations	37,000 H.P.
	<u>1,762,000 H.P.</u>

BY THE CHAIRMAN - Is it true that the Beauharnois

Corporation is more or less in its infancy and has tremendous possibilities?





A. I would not say exactly in its infancy. They have plans for extension of from half a million to seven hundred and sixty thousand, and if you have driven by you would see the planks there all ready to be installed.

BY COMMISSIONER MORRISON - It has got over the advertisement stage?

A. Yes. Shown on Exhibit S/11 there are many Paper Companies in the Saguenay district, and a very large Aluminum Company, two big paper plants, and two mills of Price Brothers, and other mills, and the town of Chicoutimi.

BY THE CHAIRMAN - And those are four districts where you get your coal in, outside of Ottawa perhaps, without subvention?

A. Oh yes, we don't get subventions there because that is outside the line.

MR. McLANDERS (continues brief)

The installations listed above are in districts where large tonnages of Nova Scotia coal, in the past, have been marketed, namely:

The Saguenay District  
The Three Rivers and Shiwinigan Districts  
The Montreal District  
The Ottawa District

It is believed that after all peace-time demands are met, something like a surplus of 1,000,000 H.P. will be on the market in Quebec for any outlet available and a ready one can be found for steam raising purposes. While this surplus hydro may not displace 900,000 tons of coal in the first year or so, the figures will, in all probability, eventually be close to that amount unless there are other outlets for the energy, and this is not likely to come about for a matter of several years.

The producers of hydro electric energy follow, generally, a uniform plan of developing and generating energy three years in advance of regular market demand, (I might qualify that and say market demand for firm or



interrupted power) and it can be expected that while there are possible developments within economic range, there will continue to be a surplus of hydro electric energy as competition to coal.

No more emphatic demonstration could be given of what can happen from the competition of surplus hydro energy than the fact that in a few months time in the year 1932 there was displaced 500,000 tons of coal in the St. Lawrence district. This represented 24.5% of the sales of the previous year, and that 500,000 tons was coal produced in Nova Scotia.

Probable Displacement of Coal by Hydro Energy 1945/1946

When I speak of that, our contract year begins on the 1st of May, that means from the 1st of May this year to April 30th next year.

For example, take the Saguenay District, the following figures are the best estimate that can be prepared of what is likely to happen in that district next year.

Tons coal per year likely  
to be displaced by Hydro

Aluminum Company of Canada have been buying	250,000
Lake St. John Power & Paper " " "	40,000
News Pulp & Paper Company " " "	10,000
Price Brothers, Riverbend " " "	60,000
Price Brothers, Kenogami " " "	80,000
Port Alfred Pulp & Paper " " "	50,000
	<u>490,000</u>

BY COMMISSIONER MORRISON - Have they been buying that coal from your Company? Have you been supplying that coal?

A. Not all of it, because we did not have enough. We supplied everything we could but we didn't have enough coal to supply the full requirements, very shortly, we would have been delighted with all those orders had we had the coal.

From the table showing the new installations during the last four years, it will be noted that 1,200,000 H.P. has been installed in the Saguenay District, or an equivalent of about 1,000,000 tons of coal.

The Aluminum Company, during the past year or two, have been using most of this energy, but, in the month of



October, their operations were reduced to about pre-war level.

All the companies listed above will not likely use 100% hydro for steam, but by far the greater proportion of the requirements will be from that source. They already have electric boiler capacity and some of them have ordered, or installed, new units.

Now when we say electric boilers it might be interesting to tell you that these boilers are of very interesting design. They are not as high as that lamp and 6 ft. in diameter. Just a cylinder with three electrodes in the top. The thing occupies such a small space for the amount of steam they generate, and they are very desirable and also very clean. It is a simple thing to put this in, and they are often referred to as tea-kettles.

Steam produced from Hydro is saturated steam and while it is suitable for drying paper, it is not suitable for certain other uses in the plants where they require dry steam. The electric industry is now endeavoring to produce equipment to convert the saturated steam into superheated steam and when this has been accomplished, there will be a wider application of surplus hydro energy, and, as a consequence, proportionate displacement of coal.

One company manufacturing electric boilers is now producing five.

As an instance of how hydro energy dislocates the coal market, it may be well to mention that when the Aluminum Company made their cut back in production in October 1944 they had on hand 176,000 tons of coal which they are now offering at a sacrifice price, in fact, they have already sold 40,000 tons. They do not expect to use coal again for many years to come other than for locomotive and crane use.

I may say since I wrote this several weeks ago, the situation has further deteriorated. The Aluminum Company of Canada are supplying hydro to large plants and taking in payment for that, coal. It is estimated that the Aluminum





Company will have on hand by Spring of this year not less than 250,000 tons of coal.

BY COMMISSIONER McLAURIN - And they have to get rid of it?

A. On one hand I suppose the Coal Controller will say it is a good thing because there is a shortage of coal on this continent, it is not very serious though. But it is a dislocation on this continent and if the war should come to a sudden end it could be very embarrassing.

Q. They took it in payment?

A. Yes, and any losses they make in the sale of the coal, they make up in the sale of their hydro energy.

In the Three Rivers and Shawinigan districts displacements of coal have already been received and would be more extensive but for the fact that users have coal in storage which they wish to burn before changing over to hydro.

Some of the paper mills have made that decision and we are very glad they did.

One company, who had just finished storing the last of their coal on a certain day (and that was 11,000 tons) called up the following day asking to be relieved of the tonnage, saying that they did not expect to use coal for some years to come. That is an instance of how quickly things can change. Here they were pressing us to deliver the balance of the order, and we said as soon as possible, and we did deliver it, and then the next day they called up and said they didn't want a pound, and it is lying there to be resold.

This district has absorbed a large tonnage of coal, but in pre-war days surplus Hydro was always available, and now, an additional 225,000 H.P. has been installed. One paper company has already ordered another large electric boiler, and they have informed us that they do not expect to purchase any more coal for the next five years other than will be sufficient for a small standby. They have purchased, during the past few years, 50,000 tons per year. In this district the



estimated loss to electric steam is between 200,000 and 250,000 tons for the next five years at least, or until surplus hydro energy is absorbed.

That is in the district around Three Rivers and Shawinigan. There are a lot of paper companies in there. The Consolidated Paper Company have three mills, and the largest paper mills in the world are also operated by the International Paper Company.

BY MR. FRAWLEY - Take the company who said they would not want any coal for the next five years. What is the implication?

A. They are going to use hydro. The three big power developments on the Saguenay -

(pointing to map of electric generating plants, marked Exhibit S/12)

There is a tremendous amount of energy coming through, very much more than can be absorbed, and all these lines here are transmission lines for electric energy. A transmission line there is capable of carrying the equivalent of 350,000 tons of coal. And these are all power lines all the way down. You finally come to the Hydro Commission of Ontario, and they do not affect us to any extent. But the whole system is interconnected and they can sell power one to the other, according to the conditions and what suits them best, and there is tremendous competition from those installations, and we will lose a lot of tonnage in Quebec.

Q. Does the Ontario Hydro Electric go in for electric steam?

A. Not very much. They have not secondary power. You have firm or uninterrupted power for ordinary uses. The Power Company will enter into a firm contract, but in the Secondary or Intermittent power they will not enter into a firm contract but will get out as quickly as they can get a better price. That is what is the disturbing element.

Q. I am told in Montreal that because it is secondary power and not bound up with a firm commitment, that the Public





Utilities of Quebec do not fix a price or pay a great deal of attention to it, just because it is an off-peak proposition and they will not set a firm price.

A. I am not prepared to say anything as to that. I have heard lots of things but cannot state them for facts. But the paper companies in this area are very large users of hydro electric energy, and there is a very close relation between the paper companies and these people, because the paper companies own large tracts of land, and the same areas are the watersheds that supply the water to these power companies, and this is a great natural resource for the Province of Quebec, and they get a royalty for every ton of water that goes through the water wheels, and there is a very close relation, and the paper companies are very important to the Exchequer of the Dominion of Canada, being an industry with some six hundred millions of dollars invested and that brings in about two hundred and fifty million export dollars every year.

Q. Well perhaps not now, but your company might like to tell the Commission what your views are as to approaching the public service commission of Quebec to see if the way that is being disposed of is unfair to your company.

BY THE CHAIRMAN - That might be dangerous for this company to undertake. Perhaps it is part of our business.

BY MR. McLANDERS - Quite a number of these paper companies use both coal and electric steam. What position would we be in if we made representations like that in regard to their electric energy, and the next day go and try to sell them coal?

BY MR. FRAWLEY - I understand that these electrical companies come in and find out how much it costs to raise steam with Nova Scotia coal, and then they under-quote that. I call that unfair competition. Perhaps it is good competition, but I call it unfair.

A. It is having the surplus energy and they say it is better to put it to use.



Q. The whole system is linked up with this grid-iron system?

A. Yes.

Q. Does that not mean that there is a possibility that by connection of these off-peak units you could pretty soon get in a pretty definite supply?

A. Of course their aim is always to get the price for firm power.

Q. Can you compete against firm power price?

A. Oh yes.

Q. It is the off-peak power price that you cannot compete against?

A. Yes, because there is nothing to go by. If you offered coal for \$1.00 per ton they would sell this for 75¢.

Q. This man said he would not want coal for the next five years. What did he mean?

A. He meant by that that after 5 years they would likely have absorbed the secondary power and have to go back to the old source. It is the same with oil, but when they get the last kilowatt hour off of the watersheds, and take the last gallon of crude oil out of the bowels of the earth, they will still have coal.

BY THE CHAIRMAN - You say coal continues to be king?

A. Yes, and it is up to us to see that it is.

BY MR. FRAWLEY - But there might be abdications at some time?

A. We must see that there are not, and it is up to all of us to put our shoulder to the wheel.

Q. In other words these chaps walk in and say to a man, what is it costing you per thousand pounds of steam, and then they say, how would you like to have it for ten or fifteen cents less. Perhaps he is in a hard place financially and says he would be delighted, and they say "we will order you an electric boiler and install it and put a meter in and sell you electric power."

Q. And the Company retains the ownership of the boiler?

A. I would say so in 75% of the cases.



MR. McLANDERS (continues Brief)

The experience has been that no matter how low a consumer's cost of coal produced steam is per 1,000 lbs., the suppliers of Hydro energy will undersell.

The reason for this is that having the water impounded, the water wheels and transmission equipment available, it is better to use these for whatever revenue can be obtained than to allow the water to flow over the dam unused.

They say "Is it not better to use this water and keep your coal for the future, it is not going to last long in any case." They have quite an argument there.

It is profitable for the producers of Hydro electric energy to install electric boilers in manufacturing plants and institutions using down to 2,500 tons of coal per year.

There is a case of one Hospital in Montreal that has an electric boiler for generating steam for heating and sterilizing.

The appended statement "G" shows the breakdown of power in Quebec since 1938. It is interesting to note the decline in power for steam raising purposes from 1938 to 1943. That was on account of the great demand in war plants. Of course the Aluminum Companies were the great users. You could go into their pot house and it is lined with transformers as high as this ceiling, for hydro bringing in electric energy for melting down the ores for aluminum. I don't know what could be done to absorb this power on any scale possible with that. In the post-war years the reverse trend may be expected.

ONTARIO

As compared with Quebec, a very small increase in electric H.P. has taken place in the past four years in Ontario, the total being around 100,000 H.P.

The Ontario Hydro Commission expect to have a





surplus of only about 200,000 H.P. for 1945/46 and if their estimates are correct, not much coal, if any, will be displaced by electric energy in Ontario.

CHAPTER VIII  
COMPETITION FROM OIL

Statement "H" appended was compiled from the Department of Mines & Resources, Mines and Geology Branch, under the subject of:

Petroleum Fuels in Canada  
Deliveries for Consumption  
1927-1940

and shows the number of gallons of oil consumed in the Provinces of Nova Scotia, New Brunswick, Prince Edward Island, Quebec and Ontario, under the various classifications, and has been converted for the purpose of convenience into coal equivalents.

The consumption is classified under the following headings:

Domestic and Building Heating  
Industrial Heating and for Power  
Railways  
Bunkering  
Tractor Fuel

This statement shows a steady increase in the use of oil from 1933 to 1940 with the exception of a small decrease in 1935. The following are totals shown in the figures of the right year period.

	<u>Imperial Gals of Oil</u>	<u>Coal equivalent at 151 gals. to the ton</u>
1933	209,962,201	1,390,478
1934	252,619,618	1,672,977
1935	246,975,482	1,635,599
1936	285,657,520	1,891,772
1937	296,211,609	1,961,666
1938	331,212,464	2,193,460
1939	372,581,569	2,467,428
1940	482,741,705	3,196,965

A steady increase right through the piece.

In this eight year period the increase in the use of oil in Eastern Canada amounted to a coal equivalent of 1,806,487 tons.



In 1939 and 1940 the increase was largely due to war demands, including Bunkers for ocean going vessels; excluding those two years the gain was the equivalent of 802,982 tons.

Domestic and building heating by oil continues to grow by popularity.

While oil costs considerably more than coal to heat a home or building, many people gladly pay the extra for the added service and convenience. Notwithstanding the most strenuous efforts that may be put forth in the interest of prepared coal, for the heating of homes and buildings there is no doubt that oil will continue to offer competition that will be difficult to combat, particularly in the case of certain classes of consumers.

The use of oil for certain industrial processes is often considered necessary; for example, in glass manufacture and various metallurgical processes involving accurately controlled temperatures.

A number of industrial plants are now considering changing from coal to oil. Some are equipped for oil and did burn it before the war and in these instances it is simply a case of reverting to their regular fuel, but it is known that there are a number of plants who have been repeatedly approached by the oil industry to convert from coal to oil. An important factor in coming to a decision will be the relative price of oil. Plants located on the river and canal bank are particularly vulnerable because tankers can lie alongside and pump the oil direct to their storage tanks.

These tankers can come right up the river from Montreal and Three Rivers and Quebec and they simply hitch up their flexible pipe line into the storage with very little expense and a minimum of storage space.

Bunkering with oil is likely to remain popular due





to cleanliness, convenience and speed of delivery and high heat value of the fuel (See Chapter 6 on Bunkers).

There are two pipe lines carrying oil into Canada, one from Portland to Montreal and the other running from Michigan, U.S.A. into Sarnia. Capacity of the Portland to Montreal line is 55,000 bbls. per day of 24 hours, equivalent to 12,750 tons of coal. The other one is something less, I believe about 40,000 bbls.

There are no published rates on the cost of transporting crude oil by pipe line as against ocean tankers and railway tank cars but the best information to be had indicates that the pipe line rates are lower, and this would seem to place the refineries in the Montreal area, served by the Portland to Montreal pipe line, in a better competitive position than before its existence. This line is owned and operated by a Crown company and that might be of some use. There are four refineries here, Shell, Imperial, British American and Canadian Oil.

There is record of one industrial plant burning 60,000/70,000 tons in the St. Lawrence district that changed from coal to oil in 1938 because coal could not meet the competition. The price at which oil could be purchased equalled a price of \$4.20 per ton for coal delivered F.A.S. their wharf. That plant is situated in Three Rivers and as I say used from 60,000 to 70,000 tons, a lot of coal.

There has come into use during the war large tankers of modern design capable of carrying 120,000 bbls. of crude oil per voyage. It is said that the cost of transportation by these ships is much lower than by the older types. The competition from this source, as well as the large pipe line from Texas to Bayway in New Jersey, is giving grave concern to the coal trade in the New England States. I have no official figures to substantiate the rate by.

It might be pointed out most of the refineries



have not been modernized so as to carry out the cracking process to its ultimate in producing gasoline so that there will be a residue of heavy or bunker oil available for disposal and likely to be placed on the market in the immediate vicinity of the refineries in competition with coal.

With these new tankers the rate, I am told, is about 11¢ per barrel, and the rate before the war was somewhere around 40¢ to 50¢, so one can easily see the improvement they have made in their ability to be competitive.

It would not be surprising to find some of this bunker oil being offered at distress prices.

BY MR. FRAWLEY - You don't know anything about it at all as compared with the British Columbia situation?

A. I suppose it must be very much greater out there.

MR. McLANDERS (continues Brief)

DIESEL VERSUS COAL BURNING LOCOMOTIVES

A strong trend has developed in recent years towards employment of diesel driven locomotives particularly for switching service.

It is said that since 1937 with the exception of one year, more than 50% of all locomotives produced in the U.S.A. were Diesel driven. Apart from switching service Canadian Railways have not shown the same tendency to change from coal to other forms of power, and let us hope they do not in the future.

Diesel electric locomotives do not require frequent ash removal, coal and water supply, and have a high availability factor which makes them especially adaptable to three shift operations where continuous use of the engine is necessary.

However, the Diesel electric is not without disadvantages: For equivalent power they are larger and heavier than steam locomotives and there is nothing they can accomplish that a modern steam locomotive will not do and do it better and cheaper.



BY COMMISSIONER MORRISON - Going back, you say in the first paragraph in 1937 or since 1937 - 50% of all motors produced in the United States were Diesel driven.

A. That is right.

Q. That is based on statistics, no doubt?

A. Based on information supplied to me by one of our local Railways.

Q. Then down below you say there is nothing they can accomplish that a modern steam locomotive will not do better and cheaper?

A. A modern one.

Q. How do you reconcile those two statements? You say 50% of all locomotives made in the United States are Diesel driven?

A. Right.

Q. Then you say there is nothing that they can accomplish that a modern steam locomotive will not do and do it better and cheaper.

A. I say a modern steam locomotive, of the modern type just now coming out.

Q. You don't follow me. These are new locomotives that are built in the United States?

A. Right.

Q. And 50% are Diesel driven?

A. Yes.

Q. And you say there is nothing they can accomplish that a modern steam locomotive will not do and do better and cheaper. Are you suggesting that the new locomotives they are building in the United States are not modern? Because 100% is all new.

A. I say in the United States there is a very definite trend for the building of a modern locomotive using coal.

It is interesting to learn that the Pennsylvania Railroad, the largest handler of freight and passenger traffic, has definitely thrown in its lot with coal. On December 5th, 1944, they had on exhibition in Chicago a line of modern





coal-burning steam locomotives. This company has spent considerable money in the last few years on experimental work on coal burning locomotives, largely of the four cylinder type which lends itself to higher capacity and economy. This information, I may say, I got directly from Mr. Clement, the President of the Pennsylvania Railway, who told me that if his railway burned oil or used Diesel engines he would lose a tremendous amount of traffic in coal, and he was going to do everything in his power to see that they developed the modern steam locomotive.

Q. He had a very good reason?

A. Yes.

BY MR. FRAWLEY - And an added reason that the Pennsylvania oil is used by pipe line?

A. And they want that oil for other purposes.

MR. McLANDERS (continues brief)

They are also working with some other railroads and the General Electric Company on development of a coal burning steam electric locomotive with a high pressure boiler furnishing steam to a turbine driven generator which supplies for motors on the axles. It is believed this arrangement will be more economical in fuel consumption than any of the other locomotives. I hope they meet with the greatest of success because that will mean a lot for coal.

So far no successful development of a small efficient steam switching locomotive has been achieved that will reduce the attention needed for fueling and ash removal and make it competitive in this respect with the Diesel, but the matter is receiving serious thought and it is believed likely that a satisfactory locomotive of this type will soon make its appearance. The only Diesels with the exception of a few in use in short bits of line in the Canadian National and the C.P.R., is in the switching service, and I believe in a certain haul in the Rockies.



CHAPTER IX  
NATURAL GAS

The only production areas in Eastern Canada are located in southwestern Ontario and near Moncton in New Brunswick. Nova Scotia coals and coke are particularly affected by the distribution of Natural Gas in the latter area. For example: Sales of Natural Gas in New Brunswick during the year 1939 amounted to 567,884,000 cu. ft. or the equivalent of 31,549 tons of coal. This figure is fairly constant because 574,000,000 cu. ft. was sold in the City of Moncton during 1942, representing 31,889 tons of coal.

The quantity produced in Ontario during 1939 amounted to 12,074,527,000 cu. ft. After deducting company consumption, leakage, etc., the total quantity distributed to customers in Ontario over the same period was 11,337,644,000 cu. ft. or the equivalent of 629,869 tons of coal. Domestic consumers used 8,673,200,000 cu. ft. equal to 481,844 tons of coal.

Approximately 15,000 homes in Ontario were heated with natural gas during the year 1939. Comparative figures of quantity distributed in Ontario to consumers in 1939 and 1941 are 11,337,644,000 cu. ft. and 11,343,255,000 cu. ft. respectively. Our information is that when one well dries out another is blown in somewhere else, so on the whole there is not much likelihood of any great fluctuation one way or the other in the quantity available in Ontario. Drilling operations are being conducted in Lake Erie on the assumption that the great natural gas resources of Ohio may extend beyond the borders of that state and out under Lake Erie. Some success has attended these efforts. They did put down bore holes about a year ago and had little islands established in the Lake, but the storms came along and blew them away. However, they did get some gas.

A breakdown showing the extent of distribution and population served by natural gas in Ontario for the year 1939





may be of interest, viz:-

44 communities with populations over 1,000

63 communities with populations under 1,000

covering in all 14 counties embracing 87 townships.

The following is a statement of natural gas consumption in some of the principal towns in Eastern and Central Canada for 1942 with equivalent tons of coal.

Province	City	Millions of cu. ft. consumed	Equivalent Tons Coal
New Brunswick	Moncton	574	31,889
Ontario	Brantford	301	16,722
"	Caledonia	43	2,389
"	Chatham	494	27,445
"	Dunn	18	1,000
"	Fort Erie	142	7,889
"	Galt	150	8,334
"	Grimsby	33	1,833
"	Hamilton	569	31,611
"	Hesplor	25	1,389
"	London	1,583	87,945
"	Niagara Falls	172	9,555
"	Norwich	22	1,222
"	Oil Springs	8	444
"	Paris	42	2,333
"	Preston	60	3,333
"	Sarnia	398	22,112
"	St. Catharines	530	29,445
"	Wolland	37	2,055
"	Wentworth Co.	159	8,833
"	Windsor	100	5,555

As an example of what can be done in the way of transporting natural gas to consumer sources we mention the Texas-Oklahoma pipe line to Chicago, a distance of 1,400 miles with branch line to Detroit.

Chicago receives 200,000,000 cu. ft. daily.

Detroit ceased manufacturing gas and has depended on the natural product since the last two or three years.

It is understood negotiations are proceeding between the Texas-Oklahoma pipe line interests and Canadian interests regarding the extension of the line from Detroit to Windsor. If an arrangement should be consummated and there is an unrestricted export of natural gas from the U.S.A. to Canada, coal will be displaced to the extent that natural gas is imported.

However, it is said that the price of any gas



delivered this way would not be cheap on account of the pipe line loss and heavy pumping expense. Relay stations are required every 100 miles.

No examination has been made of the artificial gas situation as it is made from coal and does not displace it.

BY MR. FRAWLEY - Speaking of gas, you don't mention the operations of the Consumers Gas Company of Toronto.

A. That is the oldest company, they began in 1844 and never an interruption.

Q. And they use coal?

A. Yes,

Q. Do they get their coal from you?

A. No, they use imported coal. They make a lot of blue gas.

Q. Is it because you have not coal suitable?

A. They don't regard it as suitable, and if there is a market where you can introduce it against sales resistance, that is the place to go.

Q. How much coal do they use?

A. Three or four hundred thousand tons. They have a wonderful record, these people, without interruption for just about 100 years.

#### CHAPTER X

##### MARKET PROMOTION

(a) By Industry

(b) By Government - Provincial or Dominion

##### (a) BY INDUSTRY

Territorial Organizations. Dominion Coal Company in peace time distributes its coal in whole or part from Newfoundland to Western Ontario. This area is divided into the following:-

Cape Breton and Newfoundland,	with headquarters at Sydney
Nova Scotia Mainland	with headquarters at Halifax
New Brunswick and Prince Edward Island,	with headquarters at Moncton
Quebec, including Eastern Ontario as far as line drawn from Pembroke to Kingston	with headquarters at Montreal
Ontario	with headquarters at Toronto



Some of the principal accounts in the whole area served are taken care of by the Headquarters organization in Montreal.

Promoting a market for coal is quite unlike the selling of standard products, proprietary articles and such like, so widely advertised in so many forms. While advertising in various forms plays its part and undoubtedly assists particularly in promoting the sale of household coal, the problem of developing a market in heavy industry, and this is where the bulk of Nova Scotia coal goes, has to be approached from a different angle.

The view taken is that the best form of sales promotion is in the quality of the product and the service given in connection with its supply and consumption.

What the customer wants is quality and service. For example, let us examine the case of a large industrial user consuming, say 50,000 tons of coal per year. The thing that sells a company like this, year after year, is quality, service and a competitive price. The failure to supply clean coal of the best preparation may result in the loss of the order and no amount of advertising will convince that company to return to a product which they have found unsatisfactory. The lesson we learn, therefore, is to concentrate all possible effort on producing the best quality of product; after that has been done, to be sure that deliveries are made on time and that any service required by the consumer, such as assistance in connection with combustion problems, storage and handling of coal, are promptly and efficiently discharged. Given these conditions, and always providing, of course, that the price is competitive, there is little chance of the coal being displaced by any other.

The Dominion Coal Company have a long established Combustion and Service Department which it is proposed shall be expanded after the war in order to give still better service to customers. This Combustion and Service Department will also be used extensively in the promotion of sales in





territory not yet served by the Dominion Coal Company but which it is hoped may be made available. By demonstrating the coal, supplying of useful and instructive data in the form of pamphlets and descriptive literature, an entrance is obtained, and once a test is agreed to the rest is easy, providing the coal is right.

A very important function of such a Department is the demonstration to a prospective user of Nova Scotia coal of the savings which he may achieve by changes in his combustion equipment or by the installation of new equipment altogether, where it can be demonstrated that the saving to be made will warrant such action.

#### NEW INSTALLATIONS

A constant watch is kept through commercial intelligence and other Trade Journals, as well as through manufacturers of combustion equipment, as to proposed new installations. As soon as this information is received, contact is made with the prospective purchaser and every effort is put forward to convince him of the advantages to be gained by using Nova Scotia coal, in setting forth arguments in favor of the home produced product and what it means to Canada in transportation, wages, etc.

In illustrating how getting in on the ground floor is most effective, it might be mentioned that in 1939 it came to our attention through one of the publications referred to that a certain company in the United States proposed to build a new plant in Sherbrooke. The headquarters of this company is situated at Oconomowoc, Wisconsin, U.S.A.; they were at once contacted and our Combustion Engineer made a journey to their headquarters in Oconomowoc to put before them the quality of product and excellent service which the Dominion Coal Company were in a position to give providing that the right kind of equipment was installed. The result was that they purchased equipment recommended by the Combustion



Engineer designed to burn Nova Scotia coal with maximum efficiency, and since the plant opened late in 1939 the Dominion Coal Company have supplied every pound of coal which they have consumed.

In the case of coal it is considered that this kind of sales promotion is the most effective that can be employed.

This is only one instance amongst others that it is hoped that by close attention to this policy there will be few installations made in Eastern Canada not suitable for Nova Scotia coal.





Another instance we might cite is the Gaspesia Sulphite Company at Chandler who many years ago installed equipment suitable only for high fusion coal. On receiving intimation that this company proposed installation of new combustion equipment, the principal officers of the Company were contacted and asked to instal equipment capable of burning Dominion coal, which certainly is the natural fuel for them located as they are. However, they were always able to get return cargoes of American coal from the Lakes at low freighting costs in steamers carrying pulpwood to mills in the United States.

This company put in equipment to burn Nova Scotia coal and began the operation of their new plant only a few months ago and have been delighted with the results obtained from Dominion coal. In a good year they burn 50,000 to 60,000 tons of coal.

The multiplication of instances like this will help build up a market for Nova Scotia coal and in the case of this company it is a most desirable market because it is one that can be served without payment of subventions - it is a benefit to the whole country.

BY MR. FRAWLEY: That Gaspesia thing I think is very interesting. Didn't the advantage they have in their return cargoes of American coal from the Lakes just about compensate them for the fact that they were easy of access from Sydney?

MR. MACLANDERS: Oh no. They tried our coal in more than one instance. They would like very much to have burned our coal, because they are really owned by the same people in Quebec who owned the dock where at one time we placed 65,000 tons of coal which every person tried to make burn and be suitable and couldn't do it. It had to be taken off the dock.

MR. FRAWLEY: They made the changes?

MR. MACLANDERS: In any case their equipment was very old. For many years we have been talking to their people and saying, "When are you going to put in new equipment to burn our coal?"

MR. FRAWLEY: There was an element of necessity for re-



nowal in any event?

MR. MACLANDERS: Oh, quite so, but if they had put in a duplication of what was first installed we would still be in the same position. The tendency is in the case of installations to put in units that will be flexible enough to take care of everything from the low to the high, a great range of coals, in which they can burn almost anything, and the time to get these things is before the plans are drawn up for the construction of the new plant. Just now they are talking of a new ferry to operate between Halifax and Dartmouth. How that matter stands now I don't know but we must at once make representations to see if we can't get coal specified as the fuel.

STATISTICAL RECORD OF COMBUSTION EQUIPMENT INSTALLED

The Dominion Coal Company have compiled what is termed a survey of all combustion equipments in use in the whole market area, including the Province of Ontario and irrespective of what coal is being used. There are thousands of these installations and all information in connection with the type of equipment, capacity, source from which the fuel is being purchased and the price and all other pertinent information of assistance to a salesman is tabulated; when the salesman approaches a prospective buyer of Nova Scotia coal he has something to work on.

This survey required a great deal of time in compilation and keeping it up to date but it is found to be of inestimable value when developing new markets in a territory hitherto not served by Nova Scotia coal.

The dealers in Dominion coal act in cooperation with the Company in acquiring the information mentioned and the Dominion Coal Company help the dealers by giving them information and advice on the best type of equipment to burn Nova Scotia coal.

Immediately it is known that a new installation, large or small, is to be made in an area served by the Dominion Coal Company, the dealer in the area concerned is advised and reports



are required from him as to any information possible to collect that will be of help in furthering the sale of coal.

#### PREPARATION

The tendency in the United States for some considerable time has been the better preparation and sizing of coal and it is imperative that Canadian coal be put on the market with just as good preparation as the imported product, otherwise it is at a disadvantage. Realizing the importance of preparation and sizing, there was installed on the Windmill Point Dock, Montreal, in 1940 a screening plant of unique design. It is mobile, mounted upon rails and capable of being moved to the coal instead of the more expensive process of moving the coal to the plant. This plant is capable of crushing, screening and oil-treating and can handle a maximum of 4,000 tons in 24 hours. The plant has been found to be of inestimable assistance in the marketing of coal; but for its existence the T. & N.O. Railway, consuming 100,000 tons a year, could never have been served, and in the distribution of coal in the Montreal area to the dealer trade, where various kinds of preparation are required, this plant has proved very effective.

Another example of the usefulness of this piece of equipment is a situation that developed in 1943. Shawinigan Chemicals Ltd. at Three Rivers required a high grade nut coal for making coke in their unique process and this coke, in turn, is used for the manufacture of much needed war supplies. There developed a shortage of the coal they require from the Southern fields and it seemed as if their operation might have to be curtailed for lack of adequate supply. We used to supply them with a Washed Nut coal, made here, washed in the Sydney Steel Plant, but this, of course, was no longer available.

In order to get over the difficulty we imported a high grade Southern coal in run-of-mine form which was first picked to reduce the ash, then crushed and screened, and a 1 1/4 x 3/4" nut coal was prepared and shipped to Shawinigan Chemicals to the





extent of 50,000 tons during the summer of 1943. To make this quantity of nut coal we were obliged to handle over 100,000 tons of coal. None of the Southern mines would part with this size of coal as it was in great demand for metallurgical use and for domestic consumption.

I might say that the run-of-mine coal we brought in we were obliged to buy from what is known as "truck mines", small mines producing only a couple of hundred tons a day and which do not supply the larger consumers in the United States because of their small volume. It was easier to purchase the coal from them.

To have been of service to the Shawinigan people, who for years have been purchasers of Nova Scotia coal and coke, in a time of emergency is considered to have been very useful from the viewpoint of future sales.

Recently the editors of an engineering publication distributed to 300,000 addresses asked permission to use a picture of the pile of coal and the equipment at Windmill Point as a feature in their publication and to be coupled with the name of the Dominion Coal Company. These publications, I might say, go all over the continent.

BY MR. FRAWLEY: Can you wash coal there at the Windmill dock plant?

A No.

Q Has your corporation got washing facilities at all?

A Yes sir, over here.

Q That is the Steel Plant, but the Coal Corporation has none?

A At Springhill.

Q And when the Steel Plant washes it for you it charges you something for it, I suppose?

A I don't know, but it would be along the same line as custom washing in the States.

MR. KELLEY: The Steel Plant does not charge the Coal Company for washing the coal.



BY MR. FRAWLEY: Suppose you wanted to sell some coal washed and treated and properly sized?

A Well, first of all we just could not wash it because we have no facilities there, but we can make the sizes.

Q If you had to couldn't you wash that coal in the Steel Plant?

A Oh, you mean coal produced down here?

Q Yes, Cape Breton coal?

A Oh, they wouldn't have the capacity and we wouldn't be able to bid. They might get some from Springhill.

Q I am thinking of Cape Breton.

A We couldn't wash coal and be competitors in this field down here where Magog is. How are you going to get over the extra cost if you start washing the coal? You might get something extra for it but not enough to compensate for the extra expense.

Q You could do the sizing in Cape Breton?

A Well, they are sized. They burn slack coal at Magog. We have always been able to give what people want.

BY COMMISSIONER McLAURIN: Could you give me an estimate of what proportion of your Cape Breton production reaches the customer in a washed form?

A In 1939, 220,000 tons to Shawinigan and LaSalle, and the Steel Plant, whatever the consumption was that year, about a million tons.

BY MR. FRAWLEY: They washed it themselves?

A Outside the Steel Plant of course it is very small.

BY COMMISSIONER McLAURIN: What proportion of your Cape Breton coal other than what goes to the Steel Plant reaches the customer in washed form?

A I would say 200,000 to 225,000 tons out of a production of  $3\frac{1}{2}$  to 4 million tons, so that is about 6 to 7 per cent.

BY MR. FRAWLEY: What proportion reaches the customer oiled?

A Very small. There will be other oil-treating as soon as oil is available for the purpose. It is all done at Windmill Point.





Q Up to now there is no similar plant in the Cape Breton territory?

A No, and no similar plant on the North American continent.

BY MR. JENKINS: You are of the opinion that due to cost of the venture it would not be feasible to have a central washing plant to wash the coal in Cape Breton?

A I fear it would not, but we welcome any suggestions from you boys that might help to get a market. That is all going to be dealt with but we would at any time welcome suggestions from any person for finding a market for Nova Scotia coal.

BY COMMISSIONER McLaurin: And if Mr. Jenkins wishes to develop that point later ---

A Oh yes.

MR. MACLANDERS Continues: A new plant was also installed on the dock at Halifax for the purpose of preparing sized coal. The Acadia Coal Company, Stellarton, intends to instal facilities for taking off a stoker nut of from 1/4" to 3/4" size at its Albion colliery. This will supply a local demand for stoker fuel of this size and any amount surplus to the local demand will be for disposal where markets can be found. The coal will be oil treated when oil becomes available for this purpose. It is actually available now.

BY MR. FRAWLEY: It is now available?

MR. MACLANDERS: Yes, unless there has been a change since I left Montreal, as there may be, the way things go.

A screening plant is now being built for erection on Toronto Dock to make separations suitable for that market.

At the present time there is working a Committee from the Sales, Production, Combustion and Mechanical Departments under the Chairmanship of Mr. C. W. Appleton, Assistant General Manager of Coal Sales, to study in detail and in the light of the most modern research, possibilities for additional outlets for Dominion coal, particularly in regard to sized coals for stoker use. You will be hearing from Mr. Appleton some time after I get through on this subject and I think you will be



interested in hearing from Mr. Appleton, particularly the members of the Union, because he at one time worked in the pit and boiler rooms of this Corporation.

This Committee has already had tests made in the equipment used by the well known Battelle Memorial Institute, one of the best research bodies in the United States, and tests there and elsewhere are to continue until satisfactory conclusions have been reached.

It is the intention that additional equipment for the sizing and oil-treating of coal will be established at points where required.

Statement "P" is appended - a table showing the equipment and preparation facilities at the Collieries and on various docks.

Unfortunately, coal produced in Nova Scotia is generally of such a friable nature that it does not lend itself to preparation at the Collieries on account of the fact that in loading and unloading and storage on docks it soon degrades in size until it is nothing like the original product. It has been found that the only way of making a satisfactory product to compete with the harder structure U.S.A. coal is to prepare the coal on docks near where it is to be marketed and within a short time of its delivery.

By way of illustration I might say that in 1938, when I was Superintendent of Terminals, we got from our mines here in the month of May some of the most beautiful 2-inch nut coal that you could wish to see, and I tell you that by October and November of that year it was so broken down and so fine that the people would not accept it and we had to rescreen that coal in order to get rid of part of it and the balance had to be disposed of as slack. It oxidizes very rapidly.

BY COMMISSIONER McLAURIN: That is not the case with this West Virginia coal?

MR. MACLANDERS: Oh, some of them are of very firm structure, but there are others that are just as friable. Ours is



not the only one. There are scores of coals that are just as friable and far more friable than Dominion.

LIAISON WITH MANUFACTURERS OF STOKER AND COMBUSTION EQUIPMENT

Very close contact is maintained with the manufacturers in Canada of various types of stokers and of the heavy combustion equipment with the idea of influencing changes in design favorable to Nova Scotia coal and, whenever possible, to enlist their support in recommending a suitable design to their clients. It should be recorded that in every instance the fullest co-operation is obtained from these manufacturers who are only too glad to help in furthering the sale of the home produced product.

ADVERTISING

A programme of advertising is followed from year to year, using as media well established trade journals and papers throughout the territory served by Nova Scotia coal. The radio, on occasion, has been employed.

Many technical papers have been written from time to time and published in pamphlet form and also in the appropriate trade journals. These are all considered necessary to keep the name of Nova Scotia coal before the public but, as mentioned earlier in this Chapter, the very best way of furthering the sale of Nova Scotia coal is by better preparation, unexcelled service and, of course, being competitive in price.

Giving service, of course, implies personal contact which is a cardinal point in a coal sales policy. In normal times every customer is called upon at least three times a year and many of the principal ones once a month; in addition, frequent contacts are maintained by telephone. Engineers, technicians, and everyone interested in the fuel supply in a plant is contacted as well as the purchasing agent. The motto is "That the salesman who waits for the Company's advertising to bring him the business will wait until doomsday to actually get the business. His own initiative plus the Company's publicity alone make both his efforts and that of his Company





alike successful."

Sometimes there is a lot of discussion between the advertising department and the sales department as to who gets the business. The sales department generally maintain that they get it and the advertising department come back and say, "Well, you never heard of the sun putting any hay in the barn," the implication of course being that the sun makes the hay ready to go in the barn.

BY COMMISSIONER MORRISON: Who gets the last word?

MR. MACLANDERS: That's a question. It is like many other things; it is just a matter of co-operation, everyone working together.

#### STORAGE OF COAL

In recent years the Dominion Coal Company have completely changed their system of storing large quantities of coal on docks with the result that they are now able to give a drier product and obviate the hazard of fire and the degradation of coal resulting from heating even though it may not have progressed to the point of combustion. The former system normal practice was to irrigate large piles of slack coal as soon as the temperature rose above a certain point, with millions of gallons of water, with the result that in the winter the coal was saturated and gave trouble in pulverizing equipment. I wouldn't like to leave the impression that that water stays in the pile. It doesn't; it just simply runs through the pile.

The new system is to compact the coal uniformly in successive layers. This results in keeping the coal dry, storing of larger quantities in a given area, and the elimination of the fire hazard; perhaps the last mentioned is one of the great achievements in this method of storage.

By experimenting and determining the advantages to be gained by this system of storage, the Dominion Coal Company has been able to pass the information on to the large users of coal who, in most instances, have adopted the system of storage



and found it of great value. This comes under the heading of "Service" and may be considered a part of sales promotion.

This system of storage is coming more and more into practice and wherever it is used it gives excellent results. In days gone by, in fact there are still some people who maintain that coal should never be stored from more than one seams or from different mines in the same pile, yet it has been possible to store coal from 8 seams and from as many as 70 mines in a single pile and to have no trouble from heating, and the pile composed not of one size but of many sizes of coal.

BY MR. FRAWLEY: What sizes?

MR. MACLANDERS: Run-of-mine, egg, nut, nut and slack, slack.

BY MR. FRAWLEY: You do it by rolling the mass?

MR. MACLANDERS: Yes. A pile is laid down over the whole area to the depth of about 3 feet, then comes a bull-dozer and flattens that out, then comes another layer and that is repeated. This pile at Windmill Point is 102 feet high and there are thirty some layers in the pile and you can see each one.

This is quite contrary to the belief that has existed in the industry for many years. The Dominion Coal Company were pioneers in this work in Canada.

#### DOCKS

A record is maintained of all docks on the St. Lawrence River and on the Great Lakes. There are about 200 of them of which 167 are located at 67 ports in Ontario with a combined storage capacity of 9,000,000 tons of coal. Coal can be discharged at these various docks either by bulker or self-unloader but, of course, more conveniently and economically by self-unloader. Complete details of the docks are kept on file as to the size of vessel they can accommodate, the rate of discharge, capacity for storage and all other details. This information is immensely helpful when an enquiry is received from a plant which may be served by one of these docks; it enables the seller to prepare his quotation with maximum speed and to determine





the kind of equipment required for the transportation of the coal if it happens to be by water. It is often found of advantage to be able to suggest to a prospective user of coal that he may find it possible to get his supply of coal over a certain dock where there is a favorable freight rate or truck rate and thus influence the sale of coal.

BY MR. FRAWLEY: Speaking of docks, some of your docks you operate yourself?

A Yes sir.

Q You operate Windmill Point?

A Yes sir.

Q Other docks you contract?

A No; in the case of some we have a contract arrangement with them whereby they unload the coal for us.

Q At Quebec?

A Yes, at Quebec the Canadian Import Company, and also at Montreal. We would not have the dock capacity ourselves, and for another thing it is not a good thing to be saddled with too much dock capacity if times get very hard; taxes and other things.

MR. MACLANDERS continues:

(b) BY GOVERNMENTS - PROVINCIAL AND DOMINION

The Provincial Government has always evinced a desire to be helpful in any way possible. For example, tests were conducted in the Technical College, Halifax, under the direction of Professor R. P. Donkin, B.Sc. and H. A. Ripley, B.Sc., associate professors of Mechanical Engineering, in collaboration with the Dominion Coal Company's Combustion Engineer, Mr. F. C. Morrison, B.Sc., with the object of collecting data in connection with the suitability of certain coals for stoker use.

A full report of these tests will be found in the Annual Report of Mines, 1942 and 1943.

Some years prior to this, tests were run in the Technical College under the direction of Dr. Sexton.



The Fuel Research Laboratories in Ottawa under the Department of Mines and Resources have from time to time run tests to determine the suitability of Nova Scotia coal for certain uses. Coking tests, screen tests and clinkering tests have been run by them and have been of considerable assistance to Dominion Coal Company.

No better indication can be given of the interest taken by the Provincial Government in the matter of furthering the sales of Nova Scotia coal than to mention that Mr. J. P. Messervey, B.Sc., M.E., Inspector of Metalliferous Mines and Quarries, Department of Mines, Halifax, on his own initiative caused to have made certain tests in connection with coal for use in household stokers, which have proved beneficial. A whole account of his experiments and tests will be found in the Mines Report of the Province of Nova Scotia 1942, page 55.

Quite elaborate coking tests on Nova Scotia coal were conducted in collaboration with the Research Laboratories in the plant of Ottawa Gas Company in April 1932 under the supervision of Messrs. R. E. Strong, E. J. Burroughs and E. Swartzman, Engineers in the Division of Fuels, Department of Mines and Resources. Their report containing technical information, photographs and deductions is on file at Ottawa.

The Company has taken advantage of the technical assistance which Government Departments have so willingly afforded and such close cooperation has had beneficial results in increasing the Company's sales.

BY MR. FRAWLEY: About Government regulation, what do you think about the possibility of Government standards on coal, grading and standardizing by Government?

A Well, it depends upon what is meant by that, Mr. Frawley, to what extent you propose standards. In a coal as friable as ours I would certainly shy clear of anything like that that would compel you to give a certain screen test of coal, because that would depend upon the time you had your coal in storage and many other factors, loading and unloading, etc.





I don't think that is a thing that should be advocated in the case of Nova Scotia coal.

Q There is a feeling as far as Western coal is concerned--it has gone out as just coal and some has gone down into Ontario where it was found unsuitable--that there should be Government standards of coal very much like the matter of apples, sold on standards of names and labels.

A I don't advocate that at all, Mr. Frawley. I might read to you from the Monthly Bulletin of the British Coal Utilisation Research Association, of which the president was Robert W. Foote, O.B.E., M.C., etc., reading at page 323 of Vol. VIII, No. 11, Nov. 1944, the paper states that the coal producers in the U.S.A. have become involved in a fantastic situation owing to their over-compliance with the demand for sizes, grades and exceptional purity of products. This thing has been carried too far; it already has been carried too far in the United States. Some years ago competition was so keen they began to make those graded sizes varying only by 1/8 or 1/4 inch, so that it became impossible to balance the output of your mines. When you get making all those different sizes of coal they have got to go somewhere. Now if you can't balance your daily production of those various sizes you soon find piling up one or two particular sizes, which then you are inclined to dump on the market and sell at a loss, and I will tell you that in the United States they are going back, not back to where they were, but it is all a question of where the pendulum swings. It can swing so far one way but now it is swinging back near the centre. You can go too far, and particularly with coals that are stored like ours. Probably other coal is marketed day by day but it has not been possible to do that with our coal and I would not, for one, want to subscribe to any policy of screen tests and a definite standardization that you would have to make.

BY MR. FRAWLEY: Not for Nova Scotia, perhaps, not because of





the kind of coal but the peculiar sales operation that you have to perform.

A It would not be a good thing for this industry.

BY COMMISSIONER McLAURIN: And because of the friable nature of the coal.

A You have distinct problems in the West. I am not going to interest myself with the Western problems; I have enough down here.

BY MR. FRAWLEY: We are in a peculiar position in the West.

A I know that you don't bank coal out there, but here we have to go through all the operations of loading, shipping, unloading, picking it up with clam-shells, loading it on trucks or railway cars.

Q Of course finally it gets to your screening unit in Windmill Dock?

A Where we remake it, polish it up.

Q Then this Government classification, that might begin to apply there at Windmill Dock?

A Yes, quite so.

Q Do you think that might be worthy of some further consideration, as to whether or not there could be the classification upon your Windmill Dock operations?

A No sir.

BY COMMISSIONER McLAURIN: Mr. MacLanders says he doesn't want it.

A That's right. I oppose it because it would not be a good thing for this industry and anything that is not good for the Dominion Coal Company I am against it.

BY COMMISSIONER MORRISON: And the industry generally?

A When I say the Dominion Coal Company I mean every man that digs coal in the pits; I don't just mean the Company. Who makes up the Company? You have got to have every person with his shoulder to the wheel.

BY MR. FRAWLEY: I am glad to have your opinion on the record.

All I am saying is that in the Province of Alberta you will hear a lot about Government standardization and classification



of coal.

A Maybe I am forgetting that everything I am saying is going down on this record.

MR. MACLANDERS continues:

OUTLOOK FOR POSTWAR HOUSEHOLD HEATING EQUIPMENT  
BUNGALOW HEATER - SMOKELESS

Bituminous Coal Research Inc., acting in cooperation with the Stove Manufacturers Association of the United States, are working on a design of what is called a Bungalow Heater for the burning of bituminous coal.

There is little detail to be had as it is only in the development stage but it is expected that within a month or two it will have reached the stage of practical test and as far as can be learned this is likely to be a radical departure in a heating unit capable of using various kinds of bituminous coal.

The design is said to be such that no smoke is emitted at any time. This is a very important thing because many of the big cities have smoke abatement bylaws and many are considering the establishment of the same. It should be a distinct contribution to the building of a market for bituminous coals, and may prove particularly effective in displacing anthracite in large centres where Smoke Abatement Bylaws are in effect.

The actual research work is being done by the nationally known Battelle Memorial Institute, Columbus, Ohio; they are performing the work for Bituminous Coal Research Inc.

MODERN HOUSEHOLD STOVE - WARM MORNING HEATER

There is being produced in Canada a stove for household use called the Warm Morning Heater, a distinct departure in stove design. This stove has been aptly called the first real improvement in coal burning stoves in fifty years. As many as a half-million of these stoves have been sold in one year in the United States; approximately 200,000 of them were installed in Army Camps in the U.S.

BY COMMISSIONER MORRISON: Where are they manufactured?





Mr. MacLanders: Carleton Place, Ontario. The stove will maintain a fire at full rating for 12 hours or at reduced rating for 36 hours, burning a strongly coking coal without manual attention, something that has never before been accomplished in stove desing. A very important advantage of this type stove is that it is absolutely smokeless under any type of operation.

At present it seems that a magazine type highly efficient stove or furnace is most likely to be the bituminous coal industry's bid for the heating of new homes and such a bid, coupled with aggressiveness of the coal industry, ought to be quite successful in competing with gas and oil.

Talking about post-war heating something just crossed my mind now and which I would recommend that the Commission consider, and that is in the construction of any new homes that are built by the Government of this country there should be installed in those homes grates for the burning of coal, for two reasons: in the first place they are a healthy thing for any family and in the second place a chance of disposal of some coal.

At the present time the Warm Morning Heater is being tested in the Maritime Provinces and Quebec and so far all reports are satisfactory.

This stove first came off the line several months ago. However, before it was manufactured in Canada several stoves were imported from the United States by the Dominion Coal Company for test purposes and they were found to give excellent results. One of the large Canadian Railways ran extensive tests and their report indicates that these stoves will be installed in many of their stations where they are at present burning anthracite coal.

BY COMMISSIONER MORRISON: How is the price? Is it prohibitive?



MR. MACLANDERS: \$54.50 gross price. It is a stove with refractory linings and in these refractory linings there are certain ports giving the circulation of air and gases, which makes the thing smokeless to start with and gives it a long-hold fire. It is really something. It is having a tremendous sale. There is one over at the main office which can be seen.

It is believed that this stove and perhaps others embracing the same principle will displace a considerable amount of anthracite coal and would also be beneficial in places where only certain kinds and sizes of coal are readily available. There are in the Maritime Provinces and Quebec 655,000 homes and buildings heated by stoves and of this number 505,200 are heated by wood so it can be seen that there is quite a vast field for the introduction of a stove that will give service and is capable of burning almost any kind or size of coal which may be available. Nut and slack seems to give the best satisfaction but, nevertheless, the stove will burn coal in any size and quality. It will also burn wood. I might say we sent one up to Northern Quebec to a French-Canadian named Giraud. He came in one day very much agitated and said, "That stove has a weakness; there is no place to withdraw clinkers." I said, "It is not supposed to make clinkers." He said, "I bought some refuse from the building of the Shipshaw Dam and there were a lot of big spikes and bolts in it and the stove got clogged with those and I can't get them out."

#### TECHNOLOGICAL DEVELOPMENTS

The war is crowding years of technological progress into months and weeks. In the face of new developments it is sheer speculation to prophesy on the ultimate developments of the various uses of coal in the post-war years. An endeavour is being made to keep in touch with all developments wherever they may be taking place. To cover all trade journals, reports of societies, etc., is well nigh impossible so a synopsis of research reports from organizations who give service in such things is obtained, e.g., we get from a New York firm reports on





coal drawn from the following sources of supply:-

Industrial and Technical Laboratories throughout the world; Private and Government Experimental Stations; United States and Foreign Government Sources; Technical Research Organizations; Trade Associations; Chambers of Commerce; Catalogues and Special Releases from Commercial Organizations; Releases and Publications from Laboratories of Universities, Colleges and Schools; Press Clipping Bureaus and Newspapers; Trade Exhibitions, Fairs and Business Shows; Technical and Engineering Societies; latest Technical Books and Patent Periodicals published in all languages in all major countries throughout the world.

## CHAPTER XI

### EQUIPMENT UNSUITABLE FOR NOVA SCOTIA COAL

One of the most disappointing things with which a seller of Nova Scotia coal can come face to face is to find that in quoting on a certain piece of business that his price is competitive and that the purchaser is anxious to buy Nova Scotia coal but cannot do so because the stoker and furnace installations in his plant are unsuitable for the burning of the coal.

There are many large and small users of coal throughout the districts where Nova Scotia coal is available in normal times who would gladly use it if their equipment permitted and quite a few of them are located where no subvention or assistance is required to market Nova Scotia coal. In fact, very often customers are obliged to pay a higher price for special types of fuel due to design of their equipment.

This does not mean that Nova Scotia coal is not of excellent quality; actually, when used in modern equipment designed to burn coal of high sulphur, low fusion ash, it is one of the finest available in the Eastern part of the North American continent. The reason Nova Scotia coal is not usable in these equipments is that for many years, particularly in Ontario and, to a degree, Quebec, the designers and builders of furnaces adapted them to fairly low sulphur, high fusion ash coals of the Central and Eastern Pennsylvania type. The origin and reason for this practice is explained in Chapter V. When high sulphur, low fusion ash coal of the Nova Scotia type is used in these furnaces, the brickwork is broken down long before the normal





expectancy and the stoker tuyeres become fused and melt. It is not difficult to imagine the frame of mind of an operator who meets this condition.

This entails interruptions to plant operations apart from the expense involved in renewing the brickwork and tuyeres. However, there are many coals in the United States with which they would have the identical experience.

The practice followed by well established combustion companies at the present time is to recommend the purchase by the consumer of furnaces and firing equipment with maximum of flexibility so as to be able to use satisfactorily a wide range of coals and Nova Scotia coal comes within this range.

The quantity of Nova Scotia coal affected by these unsuitable equipments is approximately 500,000 tons in Quebec and Eastern Ontario. Exhibit S/14 is a map showing plants with combustion equipment unsuitable for Dominion coal. The large symbols indicate plants of 20,000 tons and over, the medium ones represent 10,000 to 20,000 tons and the little ones represent 2,000 to 10,000 tons, so there is in that area all that equipment that cannot burn Nova Scotia coal satisfactorily. It doesn't mean we would get all that, because many of them are going on hydro, but nevertheless there would be considerable tonnage.

While it is true that when the time comes that the equipment has to be renewed they will almost certainly instal equipment suitable for Nova Scotia coal, yet it is felt that the change-over to the right kind of equipment might be hastened if it were possible for the Government to give consideration to financial assistance to these companies by way of some relief in their Excess Profits Tax or some other form. The principal argument for such consideration would be the likelihood that the coal to be used by the revamped equipment would be supplied without assistance of any kind or, at the worst, a minimum of assistance, for the reason that many of these plants are located in the eastern part of the territory. Some of the plants



affected are:

<u>40,000 Tons Up</u>	<u>QUEBEC</u>	<u>Net Tons</u>
Anglo Canadian Pulp & Paper Co., Quebec City		80,000
Consolidated Paper Co., Port Alfred		60,000
Price Brothers, Kenogami Mill		80,000
Montreal Buildings various		42,000
C.I.P. Temiskaming		70,000
		<u>332,000</u>

EASTERN ONTARIO

Can. International Paper Co., Hawkesbury, Ont.	60,000
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<u>10,000 Tons Up to 40,000</u>	<u>QUEBEC</u>	
Donnacona Paper Co., Donnacona		15,000
St. Raymond Paper Co., Metabetchouan		10,000
C.P.R. Windsor Station, Montreal		20,000
Aluminum Co. (R. & S. Rly.) Arvida		15,000
H. Smith Paper Co., Beauharnois Plant		10,000
		<u>70,000</u>

EASTERN ONTARIO

H. Smith Paper Mill, Cornwall, Ont.	15,000
Canada Starch Co., Cardinal, Ont.	20,000
Hinde & Dauch Co., Trenton	15,000
	<u>50,000</u>

<u>2,000 Tons up to 10,000</u>	<u>QUEBEC</u>	
Associated Textile Mill, Louisville, Que.		4,000
Dom. Silk Dyeing Co., Drummondville		6,000
Collins Aikman Co., Farnham		2,500
		<u>12,500</u>

EASTERN ONTARIO

Nestle Milk Co., Chesterville, Ont.	5,000
Kenwood Mills, Arnprior, Ont.	2,000
Canadian Locomotive Works, Kingston	8,000
Queens University, Kingston	6,000
Ottawa Civic Hospital, Ottawa	4,500
	<u>25,500</u>

<u>GRAND TOTAL</u>	<u>550,000</u>
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Some of the above plants will in all probability go on hydro and continue while it is available. They must all, however, maintain power plants for the use of coal as a standby and ready for immediate use. That again is a tribute to where coal stands in the ultimate.

CHAPTER XII

MECHANICS OF DISTRIBUTION

Since the beginning of the war to the end of 1944 the Dominion Coal Company has distributed, including Bunker coal





supplied by the Ministry of Transport, 40,750,000 tons of coal to thousands of consumers taking from one carload to tens of thousands of tons.

A tremendous amount of handling, rehandling, screening, trimming in ship bunkers, etc., has been required; emergency situations have had to be met repeatedly; transportation difficulties have had to be overcome both by land and water; car and locomotive shortage were sometimes experienced; certain types of cars have been in short supply; frequent alarms have been sounded in official circles here and in U.S.A. concerning shortage of coal, but, notwithstanding all these, the record shows that no consumer anywhere in the territory served by the Dominion Coal ever has been without coal; stocks have been low at times but from one source or another the coal has always been forthcoming.

This is the best indication that can be given of the efficiency and adequacy of the distribution, shipping and handling facilities operated by the Dominion Coal Company.

It has not always been possible since the outbreak of war to supply exactly the class of coal required, as indeed no similar area anywhere has had precisely what they most desire but, nevertheless, no one has had to close a plant, slow down their production or go cold. Not at any time during the war has this country suffered the breakdown of distributional facilities as has been experienced in other countries, with attendant inconvenience and hardship.

I may interpolate that last winter the situation became so serious in the city of Boston that the Governor of the State of Massachusetts had formed a committee under the chairmanship of the President of one of the largest coal companies in the New England States to look into the situation, and they considered it to be so critical that they established a number of cots, hundreds in fact, in institutions in the city ready to receive people who would have to leave their homes on account of a shortage of coal. Fortunately at the last minute they were



able to overcome it, and of course we all know that in Philadelphia there was great hardship, and in other cities.

As an example of the capacity and flexibility of the Dominion Coal Company's docks and handling facilities it might be well to recall the situation which developed at the Fall of France in 1940. Some 40 steamships were in French ports, some partly discharged but mostly fully loaded. As the enemy were rapidly approaching these ports, it became necessary to hurriedly evacuate the ships. They were ordered to sea and since it was inconvenient to return them to Britain on account of the lack of facilities to unload rapidly (Britain exports but does not import coal) they were directed across the Atlantic to Canada.

London cabled Ottawa to see if the coal could be absorbed in Canada and the ships lightened quickly for urgent war service. It fell to Dominion Coal Company to absorb 200,000 tons of coal of varying size and quality.

They began to arrive early July and before the month was out they all came into port. The ships were discharged and handed to the Ministry of War Transport on an average, at all ports, of 36 hours, from the time of arrival until empty. At Windmill Point Dock in Montreal 13 ships, having a total of 79,000 tons of coal and 8,000 tons of coke, were cleared in 10 days and during that period vessels with Dominion Coal had also to be discharged. One vessel was discharged and loaded with grain and sailed for England in the space of 24 hours. That goes to show how desperate the situation was in those days. To accomplish the job in a minimum of time men worked from 7 a.m. Monday till 11 p.m. Wednesday without leaving the plant, snatching an hour or two sleep when they could. The same men returned Thursday morning at 7 a.m. again and worked through till 6 p.m. Saturday. It is a pleasure to put this on record in recognition of a splendid response by the men at a time when the nation was in dire straits.





When a large tonnage of coal is distributed to points in Ontario it is brought by large steamships from Sydney to Three Rivers and Montreal where it is transferred to Lake steamers taken through the Canal System and delivered to various docks on the Great Lakes. Some of it is shipped inland from the docks.

In order to make the transfer at Three Rivers and Montreal adequate equipment is needed. In 1939 the volume reached a point making it necessary to provide at Three Rivers a new piece of transfer equipment as it was no longer possible to handle the increased volume at Montreal. This piece of equipment is capable of loading a Lake Steamer of 3,000 tons in three to four hours and has greatly improved the facilities for taking care of Ontario business. It may be necessary in the future to expand such facilities.

CURRENT DISTRIBUTION - MARITIME PROVINCES & NEWFOUNDLAND

To service all accounts in the Maritime Provinces & Newfoundland so that an equitable distribution of available coal is made the practice is followed of drawing up a plan of distribution every six months based upon estimated output of all collieries and just before the plan is prepared customers are contacted, their stock position ascertained and allocations are made according to requirements. Coal for household use, heating of hospitals and for use in Public Services takes priority. The position is followed weekly and adjustments made to meet changed conditions, such as increased or decreased demand of consumers and upward or downward rate of output. When the plan shows that the sum total of coal is insufficient for all requirements, as happened in 1943 and 1944, arrangements can be made in good time for the importation of whatever is required to make up the deficit. For example, it was found at the beginning of 1944 that there would not be enough coal for the C.N.R. and they were so advised and made arrangements for the movement from Ohio, all rail, of over 400,000 tons into the Atlantic region.





Simultaneously a survey of transportation facilities required to move the coal both rail and water is made. In connection with the rail movement the limiting factor of the Strait of Canso has to be taken into account in relation to the total traffic to be moved across the Strait by ferry. There have been times during the war when the ferry service was inadequate.

Delivery of fuel ex. docks to consumers has become so difficult the last three winters as to present a grave problem to coal distributors and to Coal Control Officers in Ottawa. This has come about through shortage of trucks, tires, gasoline and man-power. There have been occasions, particularly in large centres, when the position has nearly reached the stage of a breakdown.

Ways and means had to be found of speeding up loading of trucks so that full use could be made of transportation facilities.

In order to speed up deliveries on Windmill Point and Hochelaga docks in Montreal, where the daily loadings to trucks reach as much as 2000 tons per day in cold weather, the Dominion Coal Company provided eleven portable storage bins of 160 tons capacity each with chutes on opposite sides and located so that trucks can load simultaneously. With the aid of these units, which are continuously replenished, and the cranes, screening plants and mechanical loaders, 26 trucks can be loaded at the same time. In this way loss of time to trucks and men is avoided and a service is rendered to the dealer trade which helps them to get coal into consumers' bins in a minimum of time. The same arrangement has permitted the Company to give better service to the many industrial concerns and institutions served by daily deliveries off dock.



CHAPTER XIII

HISTORY OF THE MARKET DURING THE PAST  
TEN YEARS SHOWING THE TREND OF FUEL  
MARKET TO OR AWAY FROM GAS, OIL, WOOD,  
ELECTRICITY OR OTHER FUELS

In preceding chapters a review has been made of hydro energy, oil and gas and it only remains to summarize the conclusions which may be drawn from the information imparted in these chapters.

HYDRO-ELECTRIC ENERGY

In the case of hydro-electric energy, the long term trend has been from coal to hydro electric energy in the Province of Quebec.

In the Maritime Provinces and Ontario there has not been a sufficient surplus to displace any appreciable amount of coal.

In Quebec, while the long term trend has been to electricity, there have been short periods when for one reason or another coal has displaced electricity, e.g., during the war years hydro electric energy has been required for primary use and there has been a steady decline of the use of secondary power, but during the post-war years the reverse trend may be expected.

Looking at it broadly, there will always be a certain amount of surplus hydro-energy on account of the fact that the established policy of the producers of hydro electric energy is to keep their developments well ahead of the demand for ordinary power demand.

The displacement of coal by hydro electric energy may not, in the long run, be such a bad thing. The presence of cheap power will be a great incentive to the building up of industries and communities in the Saguenay, St. Maurice Valley and other sections of the St. Lawrence basin and these, in turn, will create a market for coal in other directions.

It is a great thing to see the way that industry is building up in the St. Maurice Valley. It is often referred to as "the Ruhr of Canada" and if the plants continue to go in





there at the present rate we certainly will have an increased market for coal.

OIL

In the case of oil, the trend is progressively and alarmingly away from coal as may be seen from the chapter on bunker fuel and also the one on oil. Oil is a popular fuel for household heating and is attractive to various classes of industry.

The advent of the automobile and the truck brought with it the problem of an adequate supply of gasoline. In the making of gasoline there is also produced Diesel oils and heavy oils which must be marketed in balancing out the production of gasoline. As the automobile and the truck, and other forms of motor driven conveyances increase in number, it may be expected there will be a continuation of competition from heavy oils. It may be that modern processes of refining will permit the conversion of all, or nearly all, the crude petroleum into motor oil, leaving little of the heavier oils for disposal in other directions, or it may be that the future will see, as is mentioned in another brief, the pooling of the by-products of petroleum refining with like by-products obtained from the carbonization of coal. However, this lies in the future and is of no immediate assistance in the solution of the present problem.

GAS

The trend has been neither up nor down as the production of natural gas in Eastern Canada for years has been constant. However, there is now the prospect of natural gas being piped from Detroit to Windsor and distributed in the western part of Ontario. At the present the matter is only in the exploratory stage and would involve some agreement between the two countries but there is considerable discussion regarding the possibility of an extension into Canada of the pipe line now serving Detroit. If this should occur, and there is no limit placed on the amount of gas which may be exported from the United States to Canada, it will become a factor of competition with coal, but to what



extent it is hard to estimate at this time.

The following appeared in the New York "Herald Tribune" of December 22nd, 1944:-

"An agreement to pipe 5,000,000,000 cubic feet of natural gas yearly from the United States into western Ontario is contingent upon the Union Gas Company and its subsidiaries receiving enough revenue to carry out the contract and upon permission of United States authorities, it was announced today.

T. Weir, General Manager of Union Gas, said in a statement to the City Gas Company of London and the Windsor Gas Company that the plan would put gas back into 10,500 homes which converted to other fuels after the war began."

It should always be borne in mind that the producers of gas and electricity are busily engaged endeavouring to find ways and means of making their fuel more attractive to the householder. We must do likewise with coal if it is to retain its place in competition with other fuels.

#### WOOD

There are no actual figures of the amount of wood cut each year for fuel but a good approximation of the equivalent amount of coal represented can be had from a study of the number of homes and buildings which are heated with wood.

The following tabulation shows that of a total of 879,783 homes and buildings in the Maritime Provinces and Quebec, 505,186 used wood:-

	<u>Number of Occupied Buildings</u>	<u>Steam or Hot Water Furnace</u>	<u>Hot Air Furnace</u>	<u>Stoves</u>	<u>Number using wood as fuel</u>
P.E.I.	20,082	2,048	2,209	15,824	12,973
N.S.	123,228	16,143	20,333	86,752	61,244
N.B.	91,894	4,778	14,335	72,780	69,380
Quebec	644,579	112,801	52,210	479,566	361,609
	<u>879,783</u>	<u>135,770</u>	<u>89,087</u>	<u>654,922</u>	<u>505,206</u>

Assuming that 4 tons of coal would be the average used, and this is possibly low, the amount of wood burned is the equivalent of approximately 2,000,000 tons of coal.

From the information gathered by salesmen it can be safely said that the trend is away from wood to coal, although not rapidly. There is a fluctuation up and down between the choice of these fuels, depending upon economic conditions. When





profitable employment can be had in the towns and villages and farms, men prefer to work at other occupations and buy coal, but when times are dull, the tendency is to cut wood and use that as fuel.

The price of coal has a distinct bearing upon whether or not wood will be used for the heating of homes. There has not been a great change in recent years but it can be said that there is quite a definite trend from wood to coal and this can be expected to be more pronounced as the years go by, and wood within a short range of consuming centres becomes depleted. Putting in the hands of the householder a more efficient stove such as is described in another chapter, ought to have a definite effect in the displacement of wood by coal.

It is rather interesting in looking at the world figures on energy consumption that the only place where coal has gained is from wood. In every other instance it has lost. In 1913 the annual consumption of coal per capita in the world was approximately .70. At the beginning of this war it had fallen to .50. Coal throughout the whole of the world is losing out to these other fuels, oil, hydro-electric, etc., but I think it is a phase only.

BY MR. FRAWLEY: Are these figures on wood that you have from the Dominion Bureau of Statistics?

MR. MACLANDERS: Yes sir. It will be noted from the above statement that 654,912 buildings in the Maritime Provinces and Quebec are heated with stoves and here is where there appears to be a great opportunity, over a period of years, of finding an additional market for coal.

12.00 MID-DAY - SITTING ADJOURNED





AFTERNOON SESSION

The sitting resumed at 2.00 P.M. January 18th.

MR. MACLANDERS: Before proceeding with the reading of the balance of the brief I would like to finish off with this map, S/14, which I didn't do this morning. I only dealt with the plants in the Province of Quebec unsuitable for Dominion coal. Now here in Ontario there are three large blocks. There are so many plants we couldn't show them separately; there is a list here of 995 in the Province of Ontario. As I said, there are many, many plants that cannot use Dominion Coal because of their equipment and I hold in my hand here a list of just about 1,000 plants or institutions which cannot burn our coal, but the time is arriving now when a great number of those plants must be renewed, and our position in that respect should be improved. However, outside these plants there is still room for our coal if it is made possible for us to be competitive.

COKE

The subjoined figures of Coke sales in the Maritime Provinces for the last eleven years reveal a steady increase in the market for Coke as a household fuel:-

Coke Sales, Maritime Provinces

1934	39,539 tons
1935	39,720
1936	36,213
1937	38,719
1938	40,568
1939	45,734
1940	53,472
1941	64,987
1942	56,763
1943	90,940
1944	120,000 (December estimated)

Of course last year, like the last two or three years, was rather abnormal because of war conditions under which anthracite coal has not come into the country in the same amounts--certainly so in the case of Welsh, and we hope in 1945 to equal that record or better it.

Under an aggressive sales policy featuring the advantages to be derived from buying the home produced product, Coke



should continue a steady growth in opposition to anthracite and oil.

In Quebec, Coke produced in The LaSalle plant is meeting with good success. In normal times a specially selected prepared coal from Nova Scotia is supplied up to one-third of total requirements. This subject was gone into in detail by the Royal Commission of 1932 when it was established after investigation the extent to which Nova Scotia coal can be used in the LaSalle Plant. Since that year until coal became unavailable, LaSalle has regularly consumed large tonnages. For 1945 they have offered to purchase 175,000 tons but, unfortunately, the coal is not available.

BY THE CHAIRMAN: What is your normal contribution to that plant?

MR. MACLANDERS: Well, we range between 150,000 and 180,000 tons, sir. Conditions of transportation sometimes affect it. Coal lost in a particular month or week cannot be picked up because of limited capacity for washing it, etc.

#### IMPORTED COKE

Imported Coke has not interfered seriously with the domestic product. Only a small amount came into Nova Scotia from sources outside Canada and nothing to New Brunswick and Prince Edward Island except high grade Foundry Coke.

In Quebec, imports have been principally for industrial use by such plants as Aluminum Company and Shawinigan Chemicals, both of whom use Petroleum Coke found exceptionally suitable for their processes. There is also some Foundry Coke imported into Quebec.

There has been an overall downward trend in the use of coal on this continent since 1918. Per capita production reached 6½ tons in the U.S.A. in 1918 and declined to 2.95 tons in 1933. Even for 1944, a year of tremendous industrial activity, the per capita production was about 5 tons per person. That is in the U.S.A.





What is the cause of this falling away? First, the displacement of coal by oil, gas and hydro and, secondly, the great improvement in the efficiency of power generating equipment. This second cause has not always been fully appreciated but the fact is that a great contraction in consumption has taken place in the last decade or two because of this development.

As an example of what is happening along this line we quote below report published in the "Herald," Montreal, on December 21st, 1944, under the heading of "Saving in coal made by C.N.R.":-

"In 21 years, the Canadian National Railways have reduced the annual consumption of coal by 42 pounds per thousand gross ton miles, according to H.C.T. Boyd, C.N.R. representative on the railway sub-committee of the National Coal Conservation Committee. In 1923, he said today, 154 pounds per thousand gross ton miles were consumed. This was reduced to 115 pounds in 1942, to 117 pounds in 1943 and 112 pounds in 1944, with the last two months of the current year estimated. "The reduction of five pounds this year, as compared with last, may seem insignificant, but based on 1943 traffic it means a saving this year of more than 197,000 tons."

The reduced consumption of 42 pounds per thousand gross ton miles during the period mentioned is represented by approximately one and one-half million tons of coal. This is only one industrial organization and many others could be added to the list who have reduced their consumption by way of more modern equipment and more efficient methods of operation.

#### CHAPTER XIV

##### SUMMARY

After all the factors, known and variable, have been examined and weighed in the light of past experience, and due consideration is given to probable market conditions of post-war years, the problem of the coal industry in Nova Scotia from the standpoint of sales and distribution divides itself into three parts, viz.:-



1. At what level of annual output are the mines to operate?
2. Where is the coal to be distributed?
3. How is the market to be secured outside competitive limits?

On the premise that the average annual output is approximately six and one-half to seven million tons, then it is clearly evident that anywhere up to two million tons must go to Ontario. Some displacement of anthracite in the Maritime Provinces and Quebec will no doubt be achieved by continued efforts of better preparation and sales promotion; some additional tonnage may be expected through replacement of unsuitable combustion equipment; gains will be made, but slowly, against wood; yet all these will be wholly inadequate to provide a prompt outlet when coal becomes available. Nothing that can be done in the light of present knowledge can provide an immediate adequate market short of territory reaching to Central and Western Ontario.

To reach the Ontario market and part of the Quebec market, assistance in some form is absolutely necessary and the extent of such assistance is dependable on so many unpredictable factors as to make it quite impossible to state at this time with any degree of exactness the measure of assistance required. The acquisition and maintenance of distant markets ought to be established upon a firm and continuing permanent basis to permit the industry to make long term plans with a reasonable degree of security and as an assurance to industrial, railway and other consumers of coal of a continuous dependable source of supply.

By a realistic view of the limiting factors of geographical position and geological formations, by closest co-operation on the part of every one, the industry should prosper as Canada prospers.

It is essential that stimulus be given to an industry so important to our national economy both in times of war and peace.



The Dominion Steel and Coal Corporation wish to express their appreciation of having had the opportunity of presenting their views before this Royal Commission and trust that the information submitted may be useful to the Commission in their deliberations.

T. S. MacLANDERS Sworn. Examined by Mr. Frawley.

Q Yesterday we were dealing particularly at the bottom of page 39 and top of page 40 of your brief with the question of the drawback on coal imported for use in the Canadian steel industry?

A Yes.

Q And I made what was obviously an incorrect remark. I stated the same situation exists with regard to Canadian coal and you answered no. You overlooked it at that time but there is a piece of legislation which does that very thing?

A Quite.

Q Chapter 6 of the Statutes of Canada 1930 , "An Act to place Canadian coal used in the manufacture of iron or steel on a basis of equality with imported coal."

A Hardly on the basis of equality. I think it is  $49\frac{1}{2}$  cents per ton.

Q That was at a time when the duty was 50 cents?

A Quite.

Q And the duty is now 75 cents and the Statute has not been changed to take care of that difference?

A Actually our competitors get a 99% drawback on the 75 cents, so that they get 74 cents where we get 49.

Q There is only one thing at the moment I want to ask you about. You have been using the year 1939 as the market which you would like to regain in the post-war period?

A Yes. We would like to regain that and we would like to add to it. In fact I had intended in 1940 to possibly add to that but the war intervened and of course we had no chance.





- Q But what I am really thinking about, for your post-war business your sights are raised over and above the 1939 tonnage?
- A We are shooting over open sights all the time. We will take everything we can get.
- Q The 1939 tonnage looks small now as compared to the 1944 tonnage?
- A Oh yes, comparatively so.
- Q All I am wanting to call to your attention is this quite fundamental proposition as to whether or not that 1944 tonnage is going to be maintained or whether you feel it is inevitable that we go back to the 1939 tonnage?
- A You mean the total consumption of coal in the Dominion of Canada, which now is about 44,000,000 tons?
- Q Yes.
- A I would say no but I would also state that I would not expect the consumption of coal in this country to recede to the level of 1939, because surely a country like Canada is going to make progress, but I don't think it will be rapid enough to keep that consumption up to 44,000,000 tons.
- Q You think there will be a recession in the tonnage which the coal industry enjoys, shall we say, in 1944?
- A My opinion is that you cannot avoid some recession. I can't see that this country is going to be able to absorb 150 to 200 million tons of steel, which is now being made. It might in the immediate years after the war for reconstruction purposes but I can't see that. I have no wish to be pessimistic.
- Q And if there is that recession in steel then there is a corresponding recession in coal?
- A Quite.
- Q I am more interested in your not leaving the impression with the Commission that you simply expect to just automatically go back to 1939 tonnage and be content with that?

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A Were it not for the impact of this hydro-electric we certainly would have had a larger market than in 1939, provided we had assistance, but the hydro is going to make a tremendous difference and what we lose in Quebec there is only one place to make it up and that is in Ontario.

Q It is all premised on Government assistance?

A Absolutely.

Q You think you may be somewhere in between 1939 and 1944 to go into the post-war period?

A I would hope that we would surpass 1939.

Q There was just one other little point. You say that up at Noranda there is a problem there with coal covered with snow in the wintertime. It is not very suitable for their operation?

A No, it is not.

Q How are they getting along now with American coal?

A They are getting on because they are getting a comparable quality of American coal. They didn't put any in storage there until two years ago, I think. I endeavored from the outbreak of war to persuade them to do so because I could foresee the possibility of that plant's operations being interrupted. Just the other day they had the worst snowstorm in 50 years in the United States and many of the mines are down, so Noranda has put in a storage, but as a safeguard. Of course they can dry their coal. They do pre-heat it and still they don't get the moisture down to as low a point as they would like.

Q What I am thinking of is this, you have had to deal with Noranda in a particular way and that is why you have a particular sort of symbol on your map for Noranda?

A No, the reason for that is because we can in the summer when we bring coal up the river head our steamer up to Montreal and transship to Noranda, we can be competitive because the big haul on American coal is \$3.30 per ton.

Q Where they would get it if you didn't supply it, you mean?

A Yes, where they would get it, so the price is based upon that for competition. Our coal to Noranda may go from Three Rivers





it may go from Montreal, and also all rail from the mine, but what goes all rail from the mine must be assisted, we can't be competitive, but what goes by steamer and rail we are competitive without assistance of any kind.

Q I am thinking of something else. Let me put it to you this way. Are these people finding that because of the war and the necessity of taking American coal they have had to forego some of the conditions of business that they have imposed on your company?

A No, not so, because it was no imposition on us whether they stored coal and they didn't, because it is to their disadvantage, because they went to the cost of putting it in and they will be taking it out.

Q Did they not store coal when they were buying from you?

A No. It never reacted against our total sales to Noranda. We always supplied them 100 per cent.

Q Did it call for any greater measure of Government assistance because they didn't put in storage?

A No, not a cent, I don't think.

EXAMINED By Mr. Wade.

Q You know of course that I make no pretensions of being an expert on the matter of coal so that I am definitely seeking information from you as an expert. This is the difficulty the Union has in understanding the Company's plans for markets in Central Canada after the war. Apparently in 1944 that central market consumed approximately 21,000,000 tons of bituminous coal and about  $3\frac{1}{2}$  million tons of anthracite. Would you just for the sake of argument assume that we are going to have approximately the same level of industrial activity and employment after the war as we have now. Now is it, assuming that there will be a consumption of 21,000,000 tons of bituminous, the Coal Company can only look to a market of 2,000,000, 3,000,000?

A I dealt with that in the brief, Mr. Wade. Speaking of 21



millions after the war is assumption and speculation. No man knows. We shall have to wait and see what happens. We know from past recessions in trade cycles what has happened and let us hope they don't repeat, but I can't see that there will be 21,000,000 tons in that Central market after the war. For instance, down here at Valleyfield, just below Montreal, is a plant operated by C.I.L. but called D.I.L, Defence Industries Limited, manufacturing nothing but stuff to kill men. Surely that is not going to continue. We have supplied every pound of coal to that plant, beginning in 1940 with 125,000;

it is now down to 90,000. I don't expect there will be any coal go into a plant like that, and you can multiply that by scores.

BY MR. FRAWLEY: Is that figure of consumption in the brief?

BY MR. WADE: No, it is the latest monthly report from D.B.S.

Can we assume that that consumption of nearly 25 million tons drops to 18 million?

A Who knows?

Q Well, 15 million, say?

A No one knows. No one can answer that question without taking an excursion into the realm of speculation and I would not like to do that.

Q Surely your assumption of a market of 2 millions is sheer speculation too? If you don't know what the market is to be what is the significance of your figure?

A Didn't I say we must expect it to be something more than 1939?

Q If you are going to assume that this drops by 50 per cent you are assuming I think by implication that industrial activity and employment is going to drop 50 per cent, because I think coal---

BY MR. FORSYTH: Has Mr. MacLanders stated that it was going to drop 50 per cent? I haven't heard him say that.

BY MR. FRAWLEY: I think what Mr. Wade is wanting Mr. MacLanders to do is to assume. Just ask him to assume.

BY MR. WADE: I have already done so.



A You are failing to take into account that in the Province of Quebec there is a large tonnage of coal that is not available to us and I have analyzed the Ontario market and I put it down at  $2\frac{1}{2}$  to 3 million tons. Now suppose Ontario's consumption after the war is considerably more than pre-war, it would not add such a great tonnage to that  $2\frac{1}{2}$  to 3 million tons. Do you see what I mean?

Q Yes, I am just asking questions.

A Don't get the idea that there is an unlimited market in Central Canada for coal, because there is not.

Q Why do the Central Ontario people have to import this bituminous coal from the States? Admittedly there is going to be a market there of at least 15 millions. Why can't more of that 15 millions come from Nova Scotia? Why does it have to come from the States?

A I think I made it clear that in order to market Nova Scotia coal in Ontario and parts of Quebec that considerable assistance is required. I think the thing to do is to get into this market and develop it year by year and see what we can do but I don't like this idea of going into speculation too much. Let's get back into production, get the market we had in 1939 and go on from there year after year.

BY MR. WADE: I would like to point out one thing, Mr. Chairman. Why I seem insistent on this point ---

BY THE CHAIRMAN: I know. Ask him the question.

BY MR. WADE: Am I not permitted to address the chair?

BY THE CHAIRMAN: The time for that will come when you have your own brief.

BY MR. WADE: May I put this question: A million tons of coal to the miners of Nova Scotia is thought of in terms of the employment, may I say of 2,000 men?

A Right.

Q So that when we play around with millions of tons of coal we are playing around with men's living, so it is of tremendous importance to the Union whether there is to be a market of





2 or 4 millions.

A Where shall I get this coal? I have lots of outlets for coal. May I expect to get this coal? I have a request for 175 tons from LaSalle.

BY MR. FRAWLEY: The Coal Controller won't let you take it up there.

A Yes, they will. Just take care of Newfoundland and the Maritime Provinces and the Coal Controller will let us put all the coal we can into the Central Provinces.

BY MR. WADE: I am asking you why Central Canada has to import American coal?

A You know the answer as well as I do.

Q I don't.

A You know we haven't got the capacity. I think that was brought out yesterday in Mr. Gray's brief.

Q It is not a question of the market then, it is a question of capacity?

A There is not an unlimited market, as I already told you, in Central Canada. The Western people will appear before this Commission and they will ask for their share of that market. I accept that. Now when we start to divide that market between us how much is going to be available?

Q Have I got this matter clear? The question as to whether or not you can get a greater share of that 15 million tons is determined primarily by the capacity of the mines?

A We can get a good share any time the coal is available up to a reasonable limit, but first give us the coal at the right price.

BY MR. JENKINS: On page 78 of your brief the first paragraph reads as follows: "Simultaneously a survey of transportation facilities required to move the coal both rail and water is made. In connection with the rail movement the limiting factor of the Strait of Canso has to be taken into account in relation to the total traffic to be moved across the Strait by ferry. There have been times during the war when



the ferry service was inadequate." Would you care to express any opinion that you may have concerning the elimination of that transportation bottleneck at the Strait of Canso?

A Repeat the question, please.

Q Would you care to express any opinion that you may have concerning the elimination of that transportation bottleneck at the Strait of Canso?

A The better the transportation the better for the coal industry and the quicker you can get your product in the hands of the man who has been kind enough to give you the order. I am for better transportation.

Q You have no definite opinion as to what should be done?

A I think that should be a matter for engineers. I have heard the possibility of causeways and tunnels and bridges.

Q In the course of your brief you pointed out certain difficulties in connection with the sales of coal and you suggested certain remedies.

A I would be all in favor of improved facilities. I don't think they are good enough.

BY THE CHAIRMAN: Some two months ago or a month and a half ago I came to the Sydney Board of Trade to see Mr. MacIntyre, who is the secretary. The combined Boards of Trade of Cape Breton Island have handed us a very splendid brief on the absolute necessity of making better transportation facilities at the Strait of Canso available not only for coal but for everything else.

BY MR. FORSYTH: There is just one thing I want to ask Mr. MacLanders. I suppose when you took the '39 basis you took it because you had figures in a pre-war year?

A We had something definite to go on, yes. And our aim is never to remain static in this business so long as we can get the coal and get the money.

Q And about this Ontario and Quebec market, may I call your attention to a statement on page 91 of the brief presented by Dr. Gray in which he says that the average of bituminous





coal importations into Central Canada from the United States over a period of 20 years ending in 1939 was 12 million tons?

A That's right.

Q So that if you pay any attention to the law of averages you must not set too high a figure for a market for bituminous coal in Ontario?

A Well, you see in this business of selling coal we have to deal in realities, not in fancies and dreams, because that will never get you the signature on the dotted line and it is our aim to sell every ton of coal that we possibly can, and in 1939 had we had more coal when it was required, and I mean by that after May, we certainly could have sold it and I know that we could have had a market in Ontario for a considerably larger tonnage and it is a fact in the fall of that year we had to augment our coal by importation, mostly because our ships began to go away in war service, but we did look in 1940, if coal were available at the right price, to upping that market in Ontario. There is a tremendous sales resistance in the Province of Ontario and I don't want to stress it, don't like to say it; nevertheless it is only natural that people who have used a certain coal for 30 or 40 years are very loath to leave it, but they will if it is put up to them in the right way and your price is competitive and coal is clean you can get in, but there is a lot of spade-work to be done.

Q I am not sure but I think you called attention in your brief to the fact that there are certain uses made of bituminous coal which either because of installations used or other reasons your coal can't sell?

A Well, there it is.

BY MR. FRAWLEY: That is the equipment?

A There are uses too; manufacture of bricks and other things where sulphur interferes.

Q Your proposition is that if you can get the coal at a price



that can be made competitive you will get the market for all you can get?

A Absolutely.

BY MR. FORSYTH: Of course your ability to increase to 15 million tons depends upon the extent to which you could shut back some of the American coal?

BY THE CHAIRMAN: What is the use of talking of supplying 15 million tons to the Central Canada market if it will take six or seven years to develop your product?

BY COMMISSIONER McLAURIN: You will never develop it, according to Dr. Gray.

BY MR. FRAWLEY: You are going to meet sales resistance on the part of Ontario, plus great salesability on the part of Pennsylvania and Ohio?

A Certainly.

Q Let me call your attention to an article by Dr. F. W. Gray, "Canada and Coal," which appeared in the Queen's Quarterly in 1943: "It is suggested that a zoning of coal market territory between the two countries could, with mutual advantage, be arranged that would relieve our country of a too marked dependence on the resources and generosity of the United States for a raw material that we cannot live without, and yet that would not deprive urbanized and industrialized Southern Ontario of the commercial advantage it possesses in easy access to the central coal fields of the United States." With that remark you would agree?

A Yes, but that takes you into the realm of high state policy. He is meaning if something could be worked out between the two countries whereby our coal could be made available within an arc like that in the New England States and then let Americans have a market in here in Southern Ontario, but you can't make plans on that.

Q You think that is what is implicit in what Dr. Gray says?

A Well, Dr. Gray is sitting there.



Q That would certainly be a high State policy all right.

A Dreams are very pleasant things until you wake up.

BY MR. WADE: A moment ago you said we had to deal with things as they are but would you not agree with this: what the reality is going to be in the future is going to be determined very largely indeed by what business tries to make that reality, and what people like you and business generally think is going to be the future, and the objectives they set themselves is going to determine that future, therefore business cannot sit back and say ---

A Is this a question?

Q Does Mr. MacLanders agree with that?

A If I were to tell you my views on the future this Commission would be sitting here for a long time.

Q I didn't ask that.

A You asked me if I think things are going to remain static.

I say no, but what is going to be this year or the year after I don't think anyone knows exactly, but I want to be ready to meet the conditions when they come.

Q My question was whether you think that what business men do now and the objectives they set themselves will determine very largely what the future is going to be?

A I hope you are not going to put the whole trend of events in the future on the shoulders of business men. We have had enough of them during the war.

MR. MACLANDERS: Now there is to follow briefs in connection with research which will be presented by Mr. C. W. Appleton. I may say that these brochures do not contain as much as we would like, for the simple reason that since the beginning of the war we have been short of man-power. Our combustion engineer is doing duty with the Ministry of War in Halifax. Our district manager in Toronto is away on Government service and three of our men are in the Services, so we have lacked man-power.





C. W. APPLETON. . Examined by Mr. Frawley.

Q You are the Assistant General Manager of Sales for the Dominion Coal & Steel Corporation?

A That's right, sir.

Q With your office in Montreal?

A That's right.

Q And as a part of your work you have been placed in charge of some research work and some test work on bituminous coal?

A That's right.

Q You have been working in conjunction with, what do you call it?

A Bituminous Research Incorporated, and with the Federal Government and Nova Scotia Government , and tests we have done ourselves.

Q And as a result of that you have put together some of the results of research work and testing you have done?

A That's right, sir.

(Page 237 follows)



BY C. W. APPLETON - Mr. Chairman and members of the Commission: As Mr. McLanders explained to you, these two booklets were actually gotten up to be useful for data in a committee that had been appointed to investigate and bring in a report on various questions with regard to post-war sales, and it was then thought it might be a good idea to present them as exhibits to you gentlemen.

BY MR. FRAWLEY - Tell us about the Committee?

A. It was a Committee appointed in the Corporation to investigate and develop, and to keep up to date with all modern means of burning bituminous coal, particularly with small domestic heaters and stoves, and heat in domestic homes generally. There is a lot of stuff here to read and there is a mass of figures back and forth through it that are available for anyone that wants to look at them later, but I think if we just went along and pointed out the high lights it would save a lot of time. I would like to start with No. 2 - Domestic. And I will be glad to try and get a few more copies if you would like to have them.

One of the things that has been very active in the coal business for the last 7 or 8 years, starting about 7 or 8 years ago, was the production of small domestic stokers for household use. The average consumption for these was something between 8 and 12 tons of coal per year.

When these stokers commenced to make their appearance, the coal people commenced to find that the ordinary sized coal that they supplied was not satisfactory to be burned in these stokers, and the demand came upon the producers to produce something that would burn.

The tonnage in Canada is not great yet in that particular type of business as against the industrial type. In the United States it has grown very fast.

One of the things was to find what size of coal was most suitable, and what seams of coal with the analysis





they had would burn best in these stokers. So as we go over the brief you will see what research we made to get some idea of what is necessary.

MR. APPLETON then starts to review Brief, Exhibit 8/9.

The history of this first letter is that a gentleman came in from a Coal Company in the United States and wanted to sell us some coal. During the conversation we asked him if he had done much research work in connection with coal suitable for these stokers (we had done some ourselves), and he said yes, and we asked him for copies of the information and he forwarded them to us.

This is a letter to the Dominion Steel & Coal Corporation, dated August 18th, 1942, from Harold Burnham, District Sales Manager of Chicago, Wilmington & Franklin Coal Co. of Chicago. He says here - "I am sending you under separate cover photostatic copies of our coal feeding tests for a domestic size underfeed stoker. These tests were all conducted by Mr. S. H. Viall, who is head of our Engineering Department. I know that they will be of interest to you and Mr. Appleton. I am also sending you a diagram of the Orient dedusting plant which will show you the method we use in dedusting coal. Naturally the success of such an operation depends upon the dryness of the mine from which the coal comes.....etc."

Now, to show you the trouble there was to get down to the size of coal that should be most effective in these stokers, these people took a stoker, filled the hopper with coal without a fire and started the stoker up, and the size of the coal was 5/8 x 10 mesh, that is about 5/8 x 1/16; pretty small. They put it through the stoker and then cut the top off of it down to the dead plates of the stoker. (He refers here to photostatics of the drawings which follow the Company's letter) The idea being to find out how much of the coal would be crushed up by the worm of the stoker when it reached the point of fire in the stoker. That has a great bearing, because the volume of air passing through



the full pit has a lot to do with the coke tree in a small domestic stoker, and if you can avoid the coke tree you get much better efficiency.

They took that size, and another  $3/4$  by 10 mesh, and another  $1-1/4$  x 10 mesh, and the results were much better with smaller sized coal. We have all found that to be true, and we find if you have a coal  $3/4$  x  $1/4$ " instead of a straight slack or  $1-1/4$  slack down, that you get a much better result in these small stokers.

Now the next item is particulars on cleaning, sizing and treating coals for -

Household stokers  
Commercial stokers  
Multiple retort or power plant stokers  
Chain Grate stokers, and  
Pulverizers.

He deals here with quite a few things and this is a long article to read, and I don't think I should read it unless you want me to, but it is a very good article on all the subjects that are important so far as the coal industry is concerned pertaining to the retail coal business. This article was written in 1943, and I will read the first few paragraphs and will explain as we go along. I think that is the best way: "Within the past few years cleaning plants of either the wet or dry type have been going in to a great extent, not only in localities where the coal has been known to carry a high percentage of ash and sulphur, but in localities where comparatively good coal is being produced.

All of this is being done for several purposes. First, to meet competition, because if one operator does it in a certain field, then the other is forced to do so in order to keep up with his competitor when their propositions meet on the desk of a prospective purchaser. Second, to satisfy a demand of the consuming public to get a more satisfactory fuel."

Then he comes to the cost factor, and then coal sizing, and he says: "With the advent of the smaller stokers over the country, there has been brought about in the



coal industry a change with reference to sizing of coal, especially so with the elimination of some of the smaller sizes, from 5/16 in. on down. In fact, some mines have made provision so that a real manufactured fuel can be made for certain uses, this being accomplished by sizing the screenings and then returning a predetermined percentage of the fines to each railroad car loaded."

He is not a coal producer.. Most of the coal producers are not in sympathy with sizing. There are about 32 sizes produced in the United States now, and they are trying to get down to a standard of something like ten.

Then he goes on to Underfeed stokers for Household Use. He says "The public today is demanding a coal of about 1/4 by 3/4 in. as one size or 1/4 by 1-1/4 in. as the other. This helps to make the coal cleaner. With these sizes there are less difficulties encountered in the jamming of screw feeders. There will be less arching in hoppers during the intermittent feeding of the coal. The coal will be more uniform in size, and there is less chance of segregation of the nut coal and the fines when delivery is made to the coal bin. More uniform sizing results in more uniform feeding."

Then he jumps to "Commercial stokers".

BY MR. FRAWLEY - This man thinks that sizing of coal is important. The second last paragraph in coal sizing "To me, the sizing of coal is without a doubt one of the most important steps in making a satisfactory fuel."

A. Yes, for Household Underfeed stokers, but when he gets to Commercial stokers he states the reverse. In Commercial stokers he starts off by saying - "1-1/4 in. or 1-1/2 in. screenings often give better results than prepared sizes either of the modified or 3/4 x 1-1/2 in. in size." And then he cites tests on boilers and stokers with that size, and he shows 74% efficiency with the screenings as against a lesser efficiency with the other size.





BY MR. FRAWLEY - He says under Commercial Stokers "1-1/4 in or 1-1/2 in. screenings often give better results than prepared sizes either of the modified or 3/4 x 1-1/2 in. in size." What is the distinction there?

A. A prepared size would be a round or square hole of 3/4 in. and it would go through and rest on a screen of 1/4 in. The fines would rest on the 1/4 in. but the 3/4 in. would be the prepared size.

Q. And the other?

A. That would be everything that would go through; everything that would go through the screen.

BY THE CHAIRMAN - From zero up to the prepared size?

A. Yes.

MR. APPLETON (continues)

In many cases the screenings, or everything through a screen, gives a much better efficiency than the prepared size. Then he goes on to Multiple Retort or Power Plant Stokers, and he recommends 1-1/4 in. or 2 in. screenings. That would be everything through again.

Then he goes to Chain Grate Stokers. With Chain Grate Stokers he recommends here that very often a sized coal is better for that type of equipment, but very often again 1-1/4 in. or 2 in. screenings give good results also.

BY MR. FRAWLEY - What is a chain grate?

A. It is like a moving grate, an endless belt made of links of steel, and the coal is fed in from a hopper and the coal lies on the grate and as the grate goes along it is consumed and the ash drops over the end. We have had good results with ordinary slack coal. There is natural draft and forced draft. With Dominion coal it is very hard to find many of these stokers that work well with the natural draft, but the forced draft has a cooling effect on the grates.

In the other brief we will show you tests we made of Springhill, Acadia and other coals. Although Acadia coal from an analytic standpoint is a high ash coal, it worked



better than any other including R. & P.

Then he goes on to Pulverizers, and there are many types of these in the district we serve, and they are very successful.

BY MR. FRAWLEY \* I am told people are working on pulverizers for domestic equipment.

A. I have heard of it but I have never seen it. Then he goes on to Dust Treating and claims for dust treating by Chemical Treating and by Water Treating, and the Results.

Q. Tell us something about this paper.

A. These people here, the Chemical Testing & Engineering Company of Chicago, are very big people in the United States and do a lot of work for coal people, such as running tests and developing information for them. This was read to the coal dealers in Detroit at one of their meetings.

Now the next article is a study that has been made by a big Coal Company in the United States. It is Item 2 (b) in the Agenda of this book. They go on to talk of domestic stokers and they say - "The stoker industry intends to produce at least 200,000 stokers per year in the post-war years." And they say that they are interested in making only their present "clinkering-type" stokers.

Q. It was prepared by who?

A. A large Company who are making a study for their own information of what sizes of coal should be produced for post-war periods.

Q. A producing company?

A. Yes. They say they expect to produce from 200,000 to 600,000 of these stokers in the next few years, and they say there is not sufficient coal of the stoker type of that nature to take care of the production of these stokers, and they are trying to retard the production of these and are bringing in a recommendation to have research bodies develop equipment that will burn larger size of coal, rather than





build more stokers that have to have coal from special seams and that sort of thing; which is much more expensive, as they get more money for the larger size.

Q. Have you not a pretty good chance to displace some American anthracite with well sized bituminous coal in stokers?

A. Yes, but if it gets to such a stage that there is such a demand for it. There are only a few seams that this coal comes from that is very satisfactory, and then it gets to a stage that it is not a business that is profitable to the Company.

BY COMMISSIONER McLAURIN - Then you have to measure the cost; it may or may not be profitable?

A. That is right.

MR. APPLETON (continues)

Now he says - "The reason for the small percentage of suitable coal lies, of course, in the definition of "successful" stoker coal. The first limiting factor is the ashfusion point which cannot be much above 2500 degrees, and is less than this in most of the successful stoker coals. The second limiting characteristic is the swelling index, or "cooking" characteristic, which is one of the reasons for excessive coke trees. This, measured by the "free swelling index" method, should be less than 7, although this characteristic can be modified to a great extent by the proper sizing of the coal. The rate of ignition is important and a tentative standard for it is complete ignition on 10 minutes under standard conditions. This characteristic may be modified by sizing to some extent. The amount of ash in the coal is important but is less important than the above mentioned factors. The general appearance of the coal also has something to do with its acceptability; but it has nothing to do with the performance after the coal is once in the stoker."

I have a little box here with coke buttons, some from Dominion, and some from Springhill and some from some of these high grade Kentucky coals. You can see the



difference in the size of them after they have been coked. That was all the same amount of coal that was put in the crucible and the swelling index is marked there. A good index for stoker coal is around 3-1/2.

BY MR. FRAWLEY - Tell us what swelling index means?

A. It is measured against a chart and the chart is designed to represent the size of the coke button, and if it came out to say size 5, or proportionately, that would be a size 5 swelling index. When you get beyond 7, that type of coal is not usually good for stoker purposes.

MR. APPLETON (continues)

Now Item 2(c) is just an exhibit of American anthracite sizes, which was put in to show the various sizes of their coals and the analysis of their coals. There was no particular reason for that other than general information.

The next item is a report on tests which we have made of our various coals. In order to get some independent information we sent some coal to laboratories in the United States who are used to dealing with high grade coals for this type of business. We sent Dominion, Springhill and Acadia coal, and they bring out a series of charts here which pretty well gives the information. They compare these coals with a high grade stoker coal from the United States, and on these charts here the various lines show how irregular our coal runs with them. However, they condemned our coal as a stoker coal, and we don't believe that. We have had sufficient tests with Dominion coal to know that while it may not do as satisfactory work as some of these other high grade coals, yet it is fairly good for domestic work if sized properly.

BY THE CHAIRMAN - The stokers around the province here use the slack or run-of-mine coal. They never size it.

A. Yes. If they get a coal, Sir, with a relative amount of coarse nuts in it, they get pretty good satisfaction. But the results are better if they get an entirely sized coal. And in the Maritime market here you will not run into competition



of these high grade coals that you will in Ontario and Quebec. We are here in this investigation with the intention of sizing a coal here in Sydney. We have in Halifax a modern new screening plant for that same purpose, and at Springhill for some time we have had our plant there equipped with screens to make 1 in. x 1/4 in. coal.

BY COMMISSIONER McLAURIN - You have not the same demand here as it exists in Ontario?

A. No.

BY MR. FRAWLEY - Why are not these Nova Scotia people interested in getting the sized coal?

A. They are, and we are trying to get it to them; that is why we have the plant in Halifax. In Sydney, you will have a domestic market here for these stokers. We estimate that the tonnage will be in Cape Breton somewhere around 10,000 tons. When you come to Halifax they can take care of this with the screening plant, and yet you have the screening plant at Springhill and Acadia, so all these things enter into the supplying of that market, and that market will be supplied with coals of each size.

Q. The business has to be attractive to you before you will worry too much about it?

A. No. If you were to put in a big expensive screening plant for 5 or 10 thousand tons of coal, it would not be a good commercial problem, but we have to design a plant that is smaller and capable of working at a proved cost.

Q. That is how you are endeavoring to meet the demand for a quality product?

A. Yes.

Q. Now that you have put in this document which you say rejects your coal as a good stoker coal, I wonder if you should not say something more about it?

MR. McLANDERS - He has already said that he doesn't believe it. It is very hard for us to believe anything against Dominion coal.





BY COMMISSIONER MORRISON - It is a Dominion coal exhibit.

MR. APPLETON - How would it be if I would say that we had these tests made for independent information of our coal, and when they came back they didn't give our coal as good a standing as we had hoped, but so far as we are concerned we do not accept this as a final decision. We believe our coal is good enough to be a good satisfactory stoker fuel.

BY MR. FRAWLEY - I commend you for putting it in, but thought you might like to say something on it rather than simply leave it here and say we do not believe that. He says that the heat releasing was slow and irregular. I suppose you have no way of contradicting that?

A. No. He gives a chart.

BY COMMISSIONER MORRISON - The results of these tests is the comparison with the high grade coal that they put out, and the remarks passed by them is in comparison with that?

BY MR. JENKINS - Did I gather that a screening plant would be put in here in Cape Breton?

A. We are considering the advisability of putting a small screening plant up, or making some adjustment, so as to make this size coal here for the Cape Breton District. To ship this coal by water is impossible. If you have to load it on trucks and take it to the ship, and then load it on the ship, and when it gets to Montreal take it out and put it in a bank, you would have 50% fines.

BY COMMISSIONER MORRISON - You would have slack, would you not?

A. Yes, practically. It is only possible with this coal, to take care of a local market with it.

Q. The market that you have in the Maritimes is a captive market?

A. Yes.

BY MR. I can only say this with regard to stoker coal, that how it will turn out we can tell you later on.

BY MR. FRAWLEY - Before you leave this, are you giving us



any other stoker tests of this Dominion coal?

A. Oh yes, there are quite a few here that we have done ourselves; and there are some here done by the Provincial Government and one by the Federal Government. We went to the Federal Government and asked them to make tests when these stokers began to come on the market. The tests were very helpful but they were not conclusive because this coal was slack coal. The Provincial Government made tests here back in 1942 and 1943, Mr. R. P. Duncan and Mr. H. A. Reiley made tests on Dominion coal and on Bras d'Or coal, and that was very helpful.

BY THE CHAIRMAN - Did they have a different opinion that that expressed?

A. They bring out that while the coals were fairly satisfactory in the slack size, that they would be better in the size form, and they say that the coals could be burned satisfactorily. And in Montreal we made quite a few tests of Dominion coal. We went to householders that had these stokers in and supplied them with a ton of coal. That is on page 5, which comes under "domestic sized coal for automatic domestic stokers". The history of that is that we put this coal in 12 different houses. We made the tests, and our findings were after following the coal as it was burned daily, that the coal did a fairly satisfactory job, and we are satisfied that the coal has possibility for this small domestic market.

MR. APPLETON (continues)

The next item here is a test that was run by the Federal Government on January 20th, 1937, and we supplied them with coal, supplied them with Emery coal and Phalen coal from the docks at Montreal, a mixture of Phalen and Emery coals. And we had fairly satisfactory results. Not as good as we would like, but not too bad.

The next test we ran in the house of one of the Officials of our Company in Montreal. We put in Dominion coal, high grade Kentucky coal, and Springhill and Aoadia coal,





and the results from those tests were very encouraging.

In fact Mr. Edwards was about as satisfied with this coal as he was with the Kentucky coal. We don't say our coal is as good, but that was his opinion, and he passed it in good faith.

BY THE CHAIRMAN - I never saw anything perfect in this world myself, but I suppose these people say it is coal that can be used and will give fairly satisfactory service. Is not that what the tests say outside of the letters?

A. Yes. Now the next one is a test, 8(a) "Report of Burning Test at Iron Fireman Office, Beaver Hall Hill." They have a big showroom, and we have the use of their stoker for any test we want to run, and we have had Dominion coal in this showroom all this Fall, 3/8 in. x 1/8 in. size, and it is giving very good results. Perhaps not as good as the Kentucky coal which we have tested in there, but it is quite passable.

Q. It is not from any particular seam?

A. No it is rather general St. Lawrence mix. It goes out every day and all off of the bank and is moved up and all mixed in together.

BY MR. FRAWLEY - It is rarely you let people buy from one particular seam?

A. No, it would be vital up there, because we could not guarantee to supply them from that seam.

Q. You do that in certain cases though?

A. We have maybe two or three cases, I don't think more than that. These tests came on, and a general review of that test (page 4 of 8(a) under General Remarks - "The coal supplied was screened from a pile of slack that had been in storage on the dock since August so it would be advisable to run comparative tests with both fresh mined and older coal to satisfy ourselves about the clinkering properties of each. While the clinker from this sample did not adhere to the tuyeres it showed signs of the ash having become fluid particularly during the coldest days when the stoker was called upon to maintain the desired temperature. To make it attractive to



the domestic user the product should be treated in some manner to assure it being dustproof.

Attention is called to the high moisture content of sample #2. This would indicate the necessity of establishing some means for keeping the product free of snow during the winter months.

Bins for direct feed domestic stokers accommodate either four or eight tons of coal, so in nearly all cases supplies must be replenished sometime during the period November to April.

Based on observations over the 14 day period that the trial was followed, the results bear out the belief that this preparation (1/8 x 3/8) is well adapted to the use of small domestic underfeed stokers."

Then in another 8(b) on the next page - "Test with Dominion 3/8 x 1/8 Stoker Slack" in an Iron Fireman Space Heater, (that is something like a hot air furnace) in a garage. He says:- "This garage is equipped with two old type, single fan coreless feed Iron Fireman Unit Heatmakers and have been burning Cavalier Reserve Coal. On November 30th approximately 1/2 ton of Dominion 3/8 x 1/8" coal was supplied here and immediately put into the hoppers. The writer inspected the fire on several occasions and found the operation quite successful. There was definitely a long "tree", but I did notice that a similar condition was experienced with the Cavalier Reserve. The "tree" was very easily broken down and the fireman on the job, who had been attending the fire, states that in his opinion he could see no difference between this coal and the Cavalier. In my opinion Dominion 3/8" by 1/8" is well adapted to this type of heater."

BY MR. FRAWLEY - What is Cavalier Reserve coal?

A. A very high grade Kentucky coal from Alcorn District that is especially good coal for this type of equipment.

Now Item 8(c) is another test we ran in a house of Mr. Curry, 1123 Sherbrooke St. West, and we had reasonably





BY MR. FRAWLEY - It was tested with the same Kentucky coal?

A. Yes.

MR. APPLETON (continues)

Now on the next page is a heater and it is the first modern heater of the ordinary stove type that has developed in 60 years. It is a wonderful thing. We have bought quite a number of these and placed them at our different branch offices and docks and have made a lot of tests. The Federal Government made a very extensive test which is also reported here. It is R.I.C.S. 182. It is a comparative burning test conducted in a Locke "Warm Morning" coal heater by E. Swartzman, and reads as follows:

"The following report presents the detailed data and results of a series of burning tests made on different types of fuels in a Locke "Warm Morning" stove at the Fuel Research Laboratories in Ottawa. These tests were conducted at the request of the Coal Controller, to determine the value of this stove for various types of coal in comparison to the station agent type stove commonly used by the Department of National Defence.

The types of fuel tested consisted of all ranks from Anthracite to Lignite, including by-product coke, and it is to be noted that, as in previous cases, the coals were evaluated in comparison with American Anthracite which has been considered as a standard.

In testing the stove, one 24-hour observation test was made on each fuel in accordance with the procedure outlined in this report. However, an additional 48-hour test was conducted with a view to determining the value of the barometric draft control supplied with the stove.

## II

### DESCRIPTION OF STOVE AND TEST SET-UP

The stove used for these tests was a medium size coal burning space heater called a 'Warm Morning' heater, manufactured by Locke Stove Company, 114 W. 11th St., Kansas City, Mo. The stove was forwarded to these laboratories by





The James Robertson Co. Ltd., Montreal, Que. on March 30th, 1943. The manufacturer's specifications which were furnished with the stove, were as follows:

Warm Morning Coal Heater - Model 120 Series

Shipping Weight (Crated).....	320 lbs.
Coal Capacity (Approx.).....	100 lbs.
Heating Capacity (Approx.).....	7-9000 cu. ft.
<u>Dimensions:</u>	
Height.....	42 $\frac{1}{2}$ in.
Diameter at top.....	20 $\frac{7}{8}$ in.
Width at base.....	23 $\frac{3}{4}$ in.
Diameter of firepot.....	16 $\frac{3}{4}$ in.
Depth of firepot.....	20 in.
Grate area.....	1.53 sq.ft.
Lid opening.....	12 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ "
Ash Pit door.....	13" x 5 $\frac{3}{4}$ "
Furnace volume.....	2.43 cu.ft.
Smoke pipe outlet.....	6 in.

Type of Grate - Revolving ring with draw centre.

Finish - Black cast top; 20 gauge blue steel shell.

Lining - Special Fire brick flues and liners - U.S. Patent No. 2,255,527."

We believe that this is a great stove for bituminous coal and we look with a great deal of hope to it developing a considerable market for our coal.

Then there is another test here on the same stove. This was done by one of the Canadian Railways and they made a very thorough test and found the stove to be quite satisfactory.

BY COMMISSIONER MORRISON - Which one of the two?

A. I would just as soon not say. We have permission to say if you want it, but I would rather not. These people test western coals, and they found this very satisfactory. And I believe that it is their intention in the future to purchase these stoves for their stations across their system.

BY MR. FRAWLEY - Stations like Fredericton Junction?

A. Something like that.

MR. APPLETON (continues)

Now the next thing here is a letter on 9(c) from The Elmer Miller Coal Company of Toledo 4, Ohio, to the Dominion Coal Company, Montreal, dated Dec. 11th, 1944.



It is really one of the most interesting things as far as the development of furnaces is concerned, in recent years. It is a magazine type hot air furnace. The letter reads as follows: "We received the three items on heating stoves, etc., back from you and found enclosed with it the accompanying letter which you no doubt will want back for your files.

While we are talking of heating equipment, I had occasion to view the Williamson Company's smokeless furnace in operation in Cincinnati the other day and to say it is revolutionary is putting it mildly. Briefly, the advantages of this furnace are:

1. It maintains a temperature in the home, without over-run, to about 1/2 degree variation - something that is not possible in any other heating device now on the market.

2. It burns bituminous coal without making objectionable smoke.

3. It holds approximately 700 pounds of coal, or approximately twice the capacity of the average stoker hopper, and needs to be filled only once a week in normal winter weather.

4. It will burn any standard stoker, nut or stove coal produced from any of our seams, and it is now being tested with a 3" x 5" egg.

5. It does not produce a clinker, but a fine ash, and the ash pit will hold at least one week's accumulation of ashes.

6. In effect it is a combination of furnace and stoker, without motor, fan, or mechanical coal feed.

7. It requires attention only every 7 days in cold weather and about every 14 days in mild weather.

The Williamson Heater Company is the worlds' largest manufacturer of cast iron, warm air, furnaces, so the manufacture is in competent hands."

It is the only one that has been built to date and it just started in operation after the middle of January,





and this gentleman that has writton us is keeping us advised on the development of it. These people have obtained a patent for Canada, and we are trying to get someone to get the agency for it over here.

Now there is a chart that is called the Ringman chart and it is a standard taken in the cities and towns whereby the density on that chart, if you look at the chart and the slack, that is what tells whether it is an objectionable smoke.

BY THE CHAIRMAN - It seems to be the best.

A. It is, and it can be developed into a hot water furnace. It is a further development of the smokeless stove (shows in chart). This is from the Pittsburg Coal Company and it is a picture of one of 12 stoves that were built; and 27 stove and furnace manufacturers in the United States got together and went to the Bituminous Coal Institute and put up the money to get someone to develop a stove, and they got the Batell Institute and they designed this. It is after the type of the "Warm Morning" heater. They built 12 of these stoves and placed them around with various coal dealers, coal people that had modern laboratories and that sort of thing. The first 12 were tested and they found weaknesses, and they built a group more, and these are being tested now and the furnace that you looked at is an off-shoot of this stove. I will read again the extract from Mr. Miller's letter to us of December 11th, 1944. "While we are talking of heating equipment, I had occasion to view the Williamson Company's Smokeless Furnace in operation in Cincinnati the other day, and to say it is revolutionary is putting it mildly."

BY MR. FRAWLEY - You say that is the same basic idea in the Williamson Furnace and the Smokeless Stove?

A. Yes. What the design is, is private, and we cannot even get that.

Q. It is not one of these you have over here in Sydney?

A. No. That is the "Warm Morning" heater. That is being built at Carleton Place, in Canada.



Q. What is the state of affairs to date on this Williamson furnace and on the Smokeless Stove?

A. The Batell Institute are still developing this Smokeless Stove. They built 12 and tested them, and now they have built a group more and in the course of the next year or so these will be on the market the same as the "Warm Morning" heater. While the Williamson furnace is not the same thing, it is on the same principle.

Q. Can you tell me where this article is taken from?

A. That was taken from "Coal equals Heat".

EXM. BY MR. WADE

Q. This new furnace, is that also smokeless?

A. Yes, that is what they are trying to do, develop stoves and furnaces that will burn coal smokelessly. The United States people are after that development because they can sell their larger sizes.

Q. That is what makes the difference in places like Toronto where there is a movement on foot to eliminate smoke?

A. Yes, and where a lot of anthracite is burned.

EXM. BY FREEMAN JENKINS

Q. It will have a two-fold effect, it will burn any size of coal which is most suitable to the people who sell it -

A. Yes, and particularly bituminous coal which is cheaper than anthracite, and which develops our market. That is why we are pushing these things.

BY MR. FRAWLEY - Do you think this stove and furnace will help you invade the Ontario market?

A. It would help, certainly.

BY COMMISSIONER McLAURIN - It would help Pennsylvania invade it too, I suppose?

A. Yes.

BY MR. FRAWLEY - These heaters and individual stoves are not as common in Ontario and Quebec as down here?

A. This Dominion Bureau of Statistics sheet gives all the Provinces. It tells what each Province, the number of homes





heated by steam heat, hot water, wood, coke, etc. This was taken at the last Dominion Bureau of Statistics.

Q. In Montreal I was told that in Montreal particularly the East end are many heated flats, heated with Quebec heaters?

A. Yes.

Q. No central heating plants?

A. That is true. It is also true of many American cities. In Chicago, and cities like that, there are an awful lot of stoves of this type. That is sort of an awkward brief to make interesting, but it has a lot to do with our type of business.

BY MR. FRAWLEY - Now the Industrial?

BY MR. APPLETON - I can do that very briefly. It is charts mostly. This article on page 2 of this section I (Industrial) is a screen test that we have made to find out what the yield would be for this stoker pea coal and for the various sizes. We made these tests out of the coal we had in Montreal to find out what yield we would get. And in Article 3(a) we have a list of the different stokers supplied in our district. For Underfeed there is a whole group, and for Overfeed, and Chain Grates and Pulverizers. Then we go on to tell what type of plant these stokers are used in, and just give information in general with regard to those stokers.

Then when you come over to these other pages here, they are really tests at various boiler plants in connection with different coals. There is not very much in that to explain, actually, other than it gives you an idea of how to get the business. If we find other coal there, we try to get them to use ours. Our Combustion Engineer goes in and we make tests and we try to get the business, and we usually do get it.

BY COMMISSIONER MORRISON - On the dollar valuation?

A. Yes. That is rather awkward to explain, but you can





read it, and if there are any questions you care to ask, I will do my best to answer them.

BY COMMISSIONER MORRISON - It is filed?

A. Yes.

Q. And it really refers to the main brief?

A. Yes.

4:05 P.M. HEARING ADJURNED



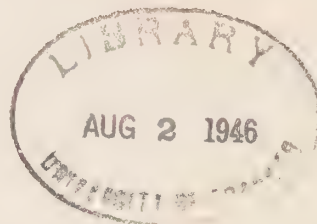
ROYAL COMMISSION ON COAL

Sydney, N. S., January 19th, 1945.

Fourth Day.

WITNESSES

T. L. McCall



EXHIBITS INTRODUCED

- S/15 - Dominion Coal Co. Ltd.  
Memorandum on Physical Conditions  
and Development of the Sydney  
Coal Field.....Page 257
- S/16 - Large map showing workings in No. 1B  
Colliery.
- S/17 - Brief on Ventilation of Submarine  
Coal Mines.....Page 292
- S/18 - Dominion Coal Co. Ltd., Memorandum  
on Coal Reserves.....Page 298.





FRIDAY, JANUARY 19, 1945.

The Commission resumed at the Court House, Sydney, N.S., at 10.00 A.M.

T. L. McCALL - Examined by Mr. Frawley.

Q You are the general manager of Dominion Coal Company Ltd.?

A That's right, sir.

Q And you are here this morning to submit a number of briefs on behalf of the Company?

A Yes. I am also chief mining engineer of the Dominion Steel and Coal Corporation.

Q Which means that you as chief mining engineer have duties to perform with respect to all the operations of the Company in the Maritime Provinces?

A Yes, with the exception of Acadia Coal Company, for which I am consulting engineer.

Q Well, take the operations of the Old Sydney Collieries?

A Yes, we look after the engineering of that.

Q And the Cumberland Company?

A Yes.

Q And the Acadia Company in a consulting capacity?

A Yes.

Q Will you just proceed to make your submissions.

MR. McCALL: I am going to start with the physical conditions and development of the Sydney coal field.

Exhibit S/15 - Dominion Coal Company Ltd.  
Memorandum on Physical Conditions and  
Development of the Sydney Coal Field

I have shown on the plan over here the workings in No. 1B Colliery. This plan I have particularly prepared in connection with the ventilation of submarine mining which I will deal with more in detail when we come to it, but perhaps a few words of explanation on this plan will help people to understand some of our submarine problems as we come across them in these notes on the physical conditions.

No. 1B Colliery is working the Phalen seam, a seam 7



feet in height. No. 1B was developed out of No. 1A workings; that is, No. 1 shaft was sunk and worked the Phalen seam down to a point and then later on in order to shorten up the haulage of the coal from the face to the surface No. 1B shaft was sunk right on the shoreline. That shaft was sunk to take the place of this shaft up here, shortening the haulage by about 2 miles. This plan is on the scale of 200 feet to the inch; that is, 200 feet in the pit is represented by one inch on this plan, and as you can see it covers a pretty extensive territory.

Dealing now with our brief:

NOTE ON THE PHYSICAL CONDITIONS AND  
DEVELOPMENT OF THE SYDNEY COAL FIELD

The Sydney coal field is situated on the north-eastern coast of Cape Breton Island, Nova Scotia, stretching for a distance of 35 miles along the shore, with a maximum penetration of nine miles inland, and dipping under the sea for an unknown distance.

Mining operations carried on afford a means of livelihood to some 50,000 residents of the towns of Glace Bay, New Waterford, Reserve, Donkin, Birch Grove, Morion, Sydney Mines, Florence, and Bras d'Or, as well as to those of the City of Sydney, in which is situated a large steel plant dependent on the coal industry as a requisite in the production of steel.

As may be seen from the accompanying map (now we are referring to the map that is with the brief) the collieries are located at intervals along the coast line. Eleven of these, on the south side of Sydney Harbour, are owned and operated by the Dominion Coal Company. On the north side, two collieries are worked by Old Sydney Collieries Limited, with some smaller operations known as the "Independents".

A railroad operated by the Sydney and Louisburg Railway Co. and some 39 miles in length with branches to each colliery collects coal from the Dominion mines to deliver it to shipping piers at Sydney Harbour during the summer and early fall months and to Louisburg in the winter months. Shipment to market is



ordinarily by boat, but because of winter closure of the St. Lawrence--the industry's main outlet to market--much coal is ordinarily held in stock-piles over the winter months pending re-opening of the River. For a period during the war years, practically all coal was moved by rail due to lack of shipping, the reverse of ordinary practice.

Old Sydney Collieries operates a short railroad connecting its collieries with a shipping pier at North Sydney.

Coal mining in Cape Breton dates from the year 1720. In 1893, seven of the operating companies were amalgamated to form the Dominion Coal Company Limited, which then became and still remains the largest producer in the Province and incidentally that Company is also the largest single producer of submarine coal in the world.

#### Geology :

The coal measures are of carboniferous age underlain by Cambrian shales and sandstones, the common contact with which defines the productive measures to the south and east while on the north-west they terminated along a fault plane, the result of an upthrow of syenitic hills.

Folding has resulted in the formation of four basins, the axes of which are parallel in an east-west direction. The field dips to the north-east under the sea at about 7% though gradients as heavy as 38% are worked on the anticlinal limbs.

BY COMMISSIONER MORRISON: Where would that be on the map?

MR. McCALL: It will be noticed that level here swings around and up like this. The reason of that is that although these seams were almost certainly laid down horizontally, subsequent earth movements brought this line up here and raised this up, and consequently we get this contour coming around the nose of this anticline, as we call it, where the strata was raised up, and on the limb of this anticline here we get inclinations which run up 40% in some spots. They are flatter on the south





side of the mine but in the centre of the area that is allotted to 1B it is very steep, and then coming to the north it is a little bit flatter again but not very much; you are getting gradients running in the 30 per cents over here.

The field is remarkably free from faults or dislocations.

Present development has reached 3 3/4 miles off shore in places and has proven a submarine area of 100 square miles of which a considerable part has already been worked in one or more seams.

Actually the farthest point out is in this mine, No. 1B, and if you will notice at the very bottom of the plan there is a point marked 3 4/5 miles from the shaft bottom. That is the point that is farthest out to sea. Actually if you take it as the crow flies to the nearest point on land you are out this distance that I see here, which is 3 3/4 miles.

Below are listed the seams in the several basins, in descending order. Those immediately above and below the horizontal line can definitely be correlated, but there is still a little uncertainty as to correlating some of the others.

<u>Morien Basin</u>	<u>Glace Bay Basin</u>
	HUB.....4'7"
	Strata.....375'
BLOCKHOUSE...8'0"	HARBOUR.....5'8"
<hr/>	
Strata.....570'	Strata.....250'
GOWRIE.....5'0"	BOUTILIER....3'9"
Strata.....210'	Strata.....90'
SPENCER.....3'6"	BACKPIT.....3'0"
Strata 340'	Strata.....112'
LONG BEACH...3'0"	PHALEN.....7'0"
Strata.....650'	Strata.....130'
COAL BROOK...3'6"	EMERY.....3'6"
Strata.....600'	Strata.....425'
COAL BROOK...3'6"	GARDINER....4'3"
	Strata.....475'
	MULLINS.....4'6"
	Strata.....1600'
	TRACEY.....5'0"



Lingan Basin

Sydney Mines Basin

BARRASOIS...5'0"  
Strata....380'  
VICTORIA...6'6"

CRANBERRY HEAD..3'7"  
Strata.....250'  
LLOYD COVE.....3'9"  
Strata.....270'  
CHAPEL POINT....3'9"  
Strata.....320'  
MAIN SEAM.....4'10"

Strata...235'  
FLIRYHOUSE..3'0"  
Strata.... 75'  
NORTHERN  
HEAD.....4'0"  
Strata.... 75'  
LINGAN.....5'6"  
Strata....900'  
MULLINS.....5'0"

Strata.....430'  
INDIAN COVE.....3'6"  
Strata.....215'  
COLLINS.....3'0"

The productive measures are made up of:

Coal.....	2 percent
Shale.....	60 percent
Fire clays.....	15 percent
Sandstone.....	23 percent

As Dr. Gray pointed out in his brief, the Harbour Seam is continuous throughout the areas we are working and that is the line that has been taken as the datum line.

MR. FRAWLEY: Is that the same seam as that known as the Sydney Seam?

MR. McCALL: Yes, it is the same seam. It is also known as the Victoria and New Waterford but we are trying to get it known as the same all through because it simplifies things.

BY COMMISSIONER MCLAURIN: What is that percentage in the table?

MR. McCALL: That is the coal in the strata. 2%, if you take 100 feet of strata you would get 2 feet of coal. We estimate that 2% of the strata is coal.

MR. CRAWLEY: Notwithstanding the fact that at the place you work you might have a seam of 5 feet of coal?

MR. McCALL: Oh, certainly, sir, this is taking the whole thickness. There might be 3,000 feet of strata out of which 2% would be coal.

Generally the roof is a weak shale, but in a few localities of small extent it is sandstone. The pavement varies from a soft fire-clay to hard shale.





The coal is bituminous. The seams vary in quality but, as presently mined, Sydney Coal is an excellent fuel of low ash, medium sulphur, and high volatile content, and is well suited for industrial, metallurgical and domestic use. It has excellent coking qualities and is of high B.T.U. value, from 13,800 to 14,200. An analysis typical of the Company's product is:

Volatile Matter	33-35%
Fixed Carbon	55-57%
Ash	8-10%
Sulphur	2-3%
Fusion Temp. of Ash	2100°F

MR. FRAWLEY: That is an analysis of a particular coal?

A No, that is a general; it is typical of a general mix of coals.

Q A composite?

A Sort of a composite.

#### Extent of Dominion Workings

As indicated in the tabulation above, only one seam, the Harbour, of 5 feet to 6 feet in thickness, is continuous and workable as to quality and height through the whole field. Three collieries operate on it today, the output of which is drawn entirely from submarine areas, all land coal in this seam having been mined. About 13 square miles of the seam has already been worked over.

The Phalen Seam, averaging 5 ft. 6 in. to 7 ft. 6 in. and lying 450 feet below the Harbour, is the seam which has been most extensively worked, the area mined out amounting to 33 square miles. With the exception of one small mine working the only land area still intact, all operations of the remaining four collieries located on this seam are entirely submarine.

BY THE CHAIRMAN: Which mine is that?

A No. 18.

Q In what district?

A That is in New Waterford and that will very soon become submarine too. This seam is workable throughout the field except in that area comprising the western third, where



it has split into a number of thin leaves separated by partings up to 45 feet wide.

MR. FRAWLEY: What are the three collieries operating on the Harbour Seam?

MR. McCALL: No! 12 Colliery in New Waterford, what we call our No! 20 Colliery and No! 26--that is for Dominion. Old Sydney Collieries Princess and Florence are both working the Harbour Seam.

Underlying the Phalen seam by an interval of 130 to 160 feet is a 3-foot seam known as the Emery, occurring in workable height over the central and eastern portions of the field, but unfortunately it becomes too thin to work to the dip of the shore line as it also has done to the west. One submarine and one land colliery operate on this seam, of which  $10\frac{1}{2}$  square miles has been worked out.

MR. FRAWLEY: Those collieries are what?

MR. McCALL: No. 11 and No. 24. 24 is submarine and 11 is a land colliery.

The Gardiner seam is a seam of varying height and quality lying 425 feet below the Emery. Over only a comparatively small section in the centre of the field is this seam of present value and a new colliery has lately been developed on it, that is No. 25 Colliery. That information, I might say, bears out what Dr. Gray was saying when he was describing the geology of this seam about the seams having been laid down in a saucer-shape with an overhanging overlap, the lowermost seam being of smallest workable extent and increasing as you get up in the series.

These are the four seams in which major operations are being carried on today. Two others, the Hub, of 4 ft. 7 in. height, and at 375 feet above the Harbour, and the Lloyd's Cove, 3 ft. 9 in. in thickness and lying 275 feet above the Hub, have worked to a small extent in the past.

Extensive diamond drilling has shown that the coal of the several other seams is not up to standards of quality demanded by present markets. There is no doubt, however, that as





the more valuable and more easily worked seams become exhausted, as still further improvements are made in the technique of heat recovery from coals now regarded as inferior, and as mining methods develop to permit of working thin seams in a manner acceptable to the miner as well as profitable to the operator, all will be worked at some time in the future to a greater or lesser extent. Nor is it inconceivable, but rather to be expected, that workable seams outcropping in submarine tracts may be found by upboring from the distant points in presently mined seams.

MR. FRAWLEY: What does that mean exactly?

MR. McCALL: Upboring? Instead of putting a bore-hole down into the ground when you get into the workings you could put a bore-hole up into the roof over your head and probe what is above you. Dr. Gray suggested the possibility of there being seams that were outcropping in the Glace Bay district in the bed of the ocean, things that we cannot see, and the only means to find out would be by this probing method of bore-holes.

The Company holds from the Crown on a rental and royalty basis a leasehold totalling 266 square miles of which 76 square miles are under long-term lease terminating in 1991, while remainder are leased for 20 year periods with right of renewal.

MR. FRAWLEY: Is that a later method on the part of the Crown in leasing to lease for the shorter period?

MR. McCALL: Yes. It was when the Company was being formed I think they wanted some--I am talking from hearsay but I understand this is it--that they wanted some definite assurance of continuity of lease and they arranged this 99 year lease to begin with, and then subsequently those other ones were added to it.

Coal mining has developed into Nova Scotia's largest industry, the Sydney coal field being the most important in the Province, and the Dominion Coal Company collieries operating therein contribute normally some 4 1/4 of the Province's 6 1/2 million tons per year.





As was only natural, the easily accessible coal of marketable quality underlying land areas was first worked, but as these supplies became exhausted, the extraction of coal continued into submarine areas which the Dominion Collieries first worked in 1903.

This lack of reserves of good quality underland coal has compelled the mining of ever-increasing quantities of coal from submarine areas, as is shown in the following tabulation:

DOMINION COAL COMPANY LIMITED

QUANTITIES OF COAL MINED FROM LAND AND  
SUBMARINE AREAS IN LONG TONS TOGETHER  
WITH CORRESPONDING PERCENTAGES

	<u>1924</u>	<u>1931</u>
Total output	2,994,977	2,508,072
Output from land areas	1,108,142	677,180
Percentage total output	37%	27%
Output from submarine areas	1,886,835	1,830,892
Percentage from submarine areas	63%	73%
	<u>1940</u>	<u>1944</u>
Total output	4,387,073	3,000,932
Output from land areas	627,721	343,711
Percentage total output	14.3%	11.40%
Output from submarine areas	3,759,352	2,657,221
Percentage from submarine areas	85.7%	88.6%

At first the submarine workings, after leaving the land areas, were under shallow cover where over 50 percent of the seam had to be left in place in the form of pillars for supporting the bed of the ocean. This inability to extract all the coal in the seam resulted in rapidly extending the workings in the only available direction, viz., seawards, and a comparison of the maximum length of haulages, again using the years 1924, 1931, 1940 and 1944 to bring out this feature, is given in the table below:



Maximum Length of Haulages in Miles, in Sub-marine Mines, Showing also Percentages in Increases of Length Compared to Year 1924

<u>Colliery</u>	<u>Length</u>	<u>1924</u>	<u>1931</u>	<u>Percent- age 1924</u>
		<u>Percentage 1924</u>	<u>Length</u>	
#1B	2.25	100%	3.94	170%
#2	2.12	100%	3.30	155%
#4	2.80	100%	3.56	127%
#12	1.38	100%	1.71	112%
#16	1.10	100%	1.43	113%
#24	0.76	100%	1.61	210%
		<u>1940</u>	<u>1944</u>	
<u>Colliery</u>	<u>Length</u>	<u>Percentage 1924</u>	<u>Length</u>	<u>Percent- age 1924</u>
#1B	4.66	208%	4.7	209%
#2	3.90	179%	4.1	184%
#4	4.66	166%	5.4	192%
#12	3.16	229%	3.2	232%
#16	2.60	236%	3.0	272%
#24	3.14	414%	4.1	538%
#20	3.38		3.7	
#26			3.8	

Not only is the haulage of coal itself becoming a serious problem in this remote undersea mining, but there is also the transportation of materials to the workings to be considered. However, the most serious factor, and the one that is becoming increasingly of importance, is the time that it takes to transport men to and from work. Wherever possible, trains of special cars, operated by suitable haulages, transport the men as far as it is possible to do so, on their way to and from work, but even with all these facilities a total of not less than one hour and fifty minutes, an average of all Dominion Coal Company's mines, is taken up in travelling during each shift.

The tabulation on page 8 of Exhibit S/15 shows maximum and average data as to distance covered the time consumed by the workmen in getting from the mine entry to their working places or vice versa.

The direction of the dip of the coal seam is out to sea, consequently the seaward advance of the productive workings has been accompanied by an increasing depth at which coal is being mined, as is shown in the following table:





Maximum Depth, in feet, at which Mining is  
Being Carried on in Submarine Mines, with  
Percentages of Increases Referred to Year 1924 as 100%

<u>1924</u>			<u>1931</u>	
Colliery	Depth	Percentage of 1924	Depth	Percentage of 1924
#1B	740	100%	1380	186%
#2	1360	100%	1565	115%
#4	1200	100%	1645	137%
#12	1220	100%	1670	137%
#16	1190	100%	1400	118%
#24	-	-	720	

<u>1940</u>			<u>1944</u>	
Colliery	Depth	Percentage of 1924	Depth	Percentage of 1924
#1B	1723	233%	1730	234%
#2	1860	137%	1900	139%
#4	1680	140%	1680	140%
#12	2050	168%	2290	187%
#16	2061	173%	2150	180%
#24	810		880	
#20	1000		1150	
#26			590	

This growing depth of cover is continuously adding to the difficulties of mining, making it far more difficult and costly to drive and maintain the necessary arterial roadways, difficulties which made it necessary to depart from the established system of room and pillar work and adopt the long-wall system in its place. This latter system on account of the original causes that compelled its adoption is more costly to operate than the room and pillar system under shallow cover.

BY MR. FRAWLEY: Do you mind elaborating just a little bit on that, as to why you had to depart from room and pillar and go to longwall?

MR. McCALL: Depth of cover, sir. We find in workings when you begin to get under deep cover that your roadways leading into your working places will not stand in the same way that they will under shallow cover. If you have got a light pressure of your rocks they may be able to withstand that pressure, but when you increase that pressure they are no longer able to withstand that pressure and they begin to give you trouble and you have got to go into a much heavier system of roof support if you want to maintain it. And arising from that



too, not only do you get trouble from the rock that is overhead but you also get trouble from your bottom, that is the pavement. If that is weak, under deep cover the pressure from the weight of the materials from the surface down on to the coal seam is transmitted through the coal seam on to the pavement. If the pavement is weak probably it will flow and go into that roadway from the sides. In room and pillar work we have that all the time, whereas in longwall work we are removing the coal in one extraction and we find that the roadways will stand, in the area that has been excavated, we find that our roadways will stand better.

BY COMMISSIONER MORRISON: How much of that strata comes down?

MR. McCALL: As you extract coal?

COMMISSIONER MORRISON: Yes.

MR. McCALL: It varies, sir, according to the nature of the strata but roughly about 15 feet, 15 to 20 feet, and then the waste chokes itself; that is, broken rock will occupy about twice as much space as rock in the solid.

The growth of the longwall system is shown in the following table, again using the same years:-

	Percentage Longwall - Room and Pillar			
	1924	1931	1940	1944
Room & Pillar	100%	77.4%	67.5%	59.7%
Longwall	-	22.6%	32.5%	40.3%
	100%	100%	100%	100%

BY MR. FRAWLEY: That is the percentage over all the collieries?

MR. McCALL: Yes. The steady expansion of the workings towards remote sea areas, carrying with it the heavy handicaps of longer transportation of men, materials and coal, vaster and more complicated systems of ventilation, and increasing depth of cover with its attendant difficulties, all combine to bring about an inevitable increase in the cost of extraction.

About the year 1927, a careful study of all the conditions surrounding submarine mining was begun, particular atten-



tion being given to the rising costs of extraction as noted above, and it became apparent that the projection of the land mines could not be continued for an unlimited distance out to sea. From this study was conceived what has since become known as the re-allocation plan. This meant stopping a colliery as a producer and redistributing its sea frontage in whole or in part to a neighboring colliery or collieries, so as to afford the latter greater lateral development. Coal formerly allocated to the two collieries would be drawn through the main haulage of one, while advantage would be taken of the existing roadways in the abandoned colliery to make use of them as airways for the continuing colliery, and so make the ventilation of the latter more effective.

Out of this plan of re-allocation also came the idea of developing overlying seams through cross-measure tunnels. In order to get as great a seaward "reach" as possible, and also to obtain maximum return from roadways already constructed, these tunnels were started from points in existing collieries at approximately  $1\frac{1}{2}$  miles off-shore.

Two such mines have now been developed, and a third will be opened up in the near future. The tunnels are driven in pairs, for haulage and ventilation purposes on a grade of  $1\frac{1}{2}\%$  in favour of the load, and varying in length from 2130 feet to 5335 feet. In the future these tunnels will probably be extended to cut other overlying seams.

There is one of these areas on this plan. I might just show what is meant by that. When it came to this place we drove a level tunnel in here for a distance of some 2100 feet and that intersected the overlying Harbour Seam, where we are now developing a new colliery which we call No. 26. Really it is all one mine but for purposes of segregation of costs we separated these out.

BY MR. JENKINS: What is the third colliery that will be opened up?





MR. McCALL: No. 18.

BY COMMISSIONER McLAURIN: Are you extracting coal from there now?

MR. McCALL: Yes sir, we are developing in 26 and getting a little coal out of it.

BY THE CHAIRMAN: This question will probably show that I am not an engineer but has it ever been thought of entering the three seams from the one opening and spreading out, what they call the joint tunnel?

MR. McCALL: Yes sir, that is what we are contemplating doing some time in the future. It is probably continuing these tunnels to intersect the overlying seams again. We have the Hub seam that we know definitely is lying above the Harbour seam and this tunnel in through No. 1B or in No. 20 could be continued and intersect; the same way that it intersected Harbour it would intersect the Hub, and then from there we would have to put up up-borings and find out if there is anything overlying the Hub.

BY THE CHAIRMAN: I wonder if some day somebody couldn't give us a little memorandum for our own particular use to show the number of the mines, where they are and on what seams?

MR. McCALL: Yes.

BY MR. FRAWLEY: You say, "Two such mines have now been developed." What are those mines?

MR. McCALL: 20 and 26. The third will be No. 18.

### Extraction

In working submarine areas special consideration must be given to the depth to which mining is being carried on, the nature and characteristics of the superincumbent strata, the number and thickness of superimposed seams, which are being or may be worked in the same area, any faults or dislocations which may be present in the seam, and the nature of the seabottom, particularly as to whether or not it is covered with clay or silt which might effectively seal any fractures. When first entering submarine areas, 50 percent of the coal had to



left standing as pillars in order to support the sea bottom. As the workings advanced and sufficient thickness of overlying strata was gained, a greater percentage of coal could be extracted, so that today in many areas the entire seam is being taken out.

BY COMMISSIONER MORRISON: That is mostly on your longwall operations?

A We are extracting pillars too in our submarine operations; we have longwall operations and pillar extraction.

Q Are you just stripping your pillars or taking them all out?

A No, taking them all out.

Q Do you encounter much crushing?

A A certain amount, yes.

MR. McCALL continues: In view of the fact that the whole future of the industry lies in this undersea coal, great care has had to be, and is being, exercised in this respect and the Company's practice, approved by the Department of Mines, has been proven safe through the total extraction of extensive submarine areas.

#### Pumping

About  $2\frac{1}{2}$  tons of water are pumped per ton of coal hoisted. The submarine workings are remarkably dry and this water comes from the old land workings. It is caught in lodgments near the shore line and pumped to the surface without reaching the working sections.

BY COMMISSIONER McLAURIN: That is not a great proportion of water to be pumped from the mines?

MR. McCALL: No sir, but when you have got, as we have, a pretty acid water it becomes expensive on your pumps and pipes and it is quite a consideration.

BY COMMISSIONER McLAURIN: There would be lots of American mines that pump more?

A Unfortunately for us there are lots of American mines that don't pump one drop of water; it flows off naturally.





Q I was in one the other day that pumped 3 tons.

A Oh yes, you will find them, but speaking on the average, and they don't have to pump against the heads that we do.

BY MR. FRAWLEY: What do you mean by the heads?

MR. McCALL: Oh, that is the vertical lift from where your pump is situated and discharges to the surface or the next lodgment.

Ventilation:

The seams are gaseous and it is necessary to circulate large quantities of air to keep the mines adequately ventilated. Through the eleven collieries of the Dominion Coal Company, fans force some 930,000 cubic feet of fresh air through the workings every minute of the day. Water gauges run as high as 11.7 inches.

BY MR. FRAWLEY: What does that mean?

MR. McCALL: That is water pressure. The pressure that is required to force that air through is shown by a water gauge, which consists of a U-shaped tube filled with water, and the pressure of the air will force the water down in one tube and it rises up in the other tube and you measure the difference between the two levels of the water and you get your water gauge.

In some cases it has been necessary to put two fans in series in the one colliery, resulting in a total water gauge of 13 inches. The fans circulating this air are driven by electric motors totalling in the aggregate 2200 H.P. Upwards of 84 miles of roadways are constructed and maintained as main intake airways, and in addition some 62 miles are maintained as returns, totalling in all 146 miles. These are main intakes and main returns with Dominion Coal collieries. Further information on this subject may be had from the accompanying memorandum on "Ventilation", which I shall give you after this.



Haulages

The length, gradient and type of mine haulage are given in the accompanying tabulation, together with the production capacity of each colliery. There follows a table there, and on account of our submarine operations and the seams dipping seawards, we have been compelled to put in some very heavy haulages underground. I don't think you will find there are many companies that have ever attained even a fraction of the haulage capacity that we have had to install. The latest addition was an 1800 H.P. hoist to haul out of No. 7 deep in No. 3 colliery.

1871

1. 1871  
2. 1872  
3. 1873  
4. 1874  
5. 1875  
6. 1876  
7. 1877  
8. 1878  
9. 1879  
10. 1880

11. 1881  
12. 1882  
13. 1883  
14. 1884  
15. 1885  
16. 1886  
17. 1887  
18. 1888  
19. 1889  
20. 1890

The cars of coal are loaded at No. 5 deep, and in order to get that up there is a direct rope haulage pulls it up and that is worked by a 1250 H.P. motor. The cars are landed onto the motor level and the electric locomotive takes hold of the car and hoists it.

No. 7 deep is also equipped now with a 1800 H.P. hoise. That is the latest addition, and the biggest one we have been compelled to put in. The grade in No. 7 deep is considerably steeper than in No. 5 deep.

Q. That is room, room and pillar?

A. Yes, it is worked by room work. No pillars will be there, but from the 1100 ft. line we had enough depth to have total extraction and we developed long-wall.

BY COMMISSIONER McLAURIN - And Nos. 5 and 7 are both in the Phalen Seam?

A. Yes.

BY COMMISSIONER MORRISON - Have you any steel work on those deeps?

A. Steel booms, no steel arch. There is steel arch on No. 17.

Q. Where does your gunite operation cease on that level?

A. We have concrete side walls and some guniting done on that, but not too happy an experience with the guniting.

Q. What would explain that?

A. Slopping out. The coal miners did not seem to lend themselves very readily to it. Possibly sand blasting previous to guniting would have done it.

Q. That is a very expensive operation?

A. Yes.

MR. McCALL (Continues brief)

#### Support of Main Arterial Roadways

The increased depth of the workings has brought about a great increase in roof pressure, requiring expensive construction, costing from \$50,000 to \$200,000 per mile.





Electrification

Since its inception the Company has made use of electrically operated machinery to an ever increasing extent. As the underground workings advanced further afield, and in recognition of the fact that electric energy is the cheapest form in which power can be transmitted over long distances, an intensive programme was undertaken about 1920 for further electrification. This is still being carried on.

Generally all main haulages as well as numerous subsidiary hoists and haulages have been electrified. Four of these running from 1200 to 1800 H.P. rank in size with any underground hoists installed elsewhere. The installation of such engines in coal mines requires large excavations, heavily reinforced. In certain instances these engines have cost as much as \$250,000 installed.

All rakes used solely for hoisting and lowering men have been electrified as is also the case with all pumping installations with the exception of certain small pumps near the working sections which are not permanent installations.

I may say that perhaps rakes is a term foreign to some people. It means a trip of cars.

BY MR. FRAWLEY - What do you mean by electrified? Do you mean electric locomotives?

A. No, the rake is the whole operation, engines and cars and everything. Fixed engines operating through ropes. But they might be electric locomotives, in fact in one case it would be correct.

MR. MCCALL (continues)

conveying equipment operating on main roadways is motivated by either electricity or compressed air, but conveyors working directly at the coal face are driven by compressed air, a practice adhered to in what perhaps may be conservative interests of safety. For the same reason all drills and coal-cutting machines are also air-operated except in the instance



of two of the smaller collieries which are but slightly gassy, where coal cutters are driven by electric motors.

The general trend to increased electrification can be seen from the tabulation given below, which shows the consumption of electric energy at the collieries for both total output and per ton output from 1913 to date.

STATEMENT SHOWING ELECTRIC ENERGY CONSUMED AND LONG TONS OUTPUT OF COAL DOM. COAL CO. LTD. 1913-1944 CAPE BRETON MINES.

<u>Year</u>	<u>K.W. Hours</u>	<u>Long Tons Output</u>	<u>K.E. Hours per ton</u>
1913	24,882,643	4,739,149	5.24
1914	27,774,581	4,287,717	6.47
1915	32,008,217	4,608,979	6.93
1916	31,424,426	4,091,990	7.68
1917	31,320,106	3,551,984	8.85
1918	33,070,882	3,271,755	10.13
1919	32,602,581	3,087,638	10.56
1920	29,913,709	3,260,558	9.18
1921	30,768,000	3,063,941	10.03
1922	34,212,454	2,985,541	11.45
1923	37,682,896	3,348,186	11.24
1924	40,095,885	2,979,039	13.43
1925	35,432,270	1,816,959	19.58
1926	51,624,500	3,858,184	13.38
1927	52,278,224	4,123,131	12.69
1928	55,819,016	3,730,674	14.95
1929	55,355,800	3,969,979	13.95
1930	59,600,018	3,439,614	17.35
1931	57,498,606	2,508,072	22.90
1932	44,716,189	2,027,686	21.96
1933	46,347,444	2,598,309	17.83
1934	57,337,024	3,642,027	15.74
1935	52,759,090	3,249,457	16.26
1936	56,886,266	3,835,766	14.78
1927	61,434,278	4,063,402	14.97
1938	62,071,210	3,446,705	18.05
1939	66,721,535	4,016,345	16.65
1940	72,057,261	4,387,073	16.40
1941	75,549,053	3,865,533	19.60
1942	77,747,280	3,831,649	20.30
1943	80,254,190	3,153,327	25.50
1944	85,882,813	3,000,932	28.60

Briefly in 1913 it was 5.2 K.W. hours per ton of coal hoisted, and in 1944 we were using 28.6 K.W. hours per ton of coal hoisted.

MR. MCCALL (continues)

Certain aparent anomalies may be noted in the above tabulation, but these may be accounted for because of variation of production, as, for instance, the protracted strike in 1925 and the period of depression in the early 'thirties'.





Electric energy is generated at a small plant owned by the Company, the bulk being purchased from Seaboard Power Corporation, which station is designed to generate power from refuse coal which the Company could not otherwise find a market for.

BY MR. CRAWLEY - Has Seaboard any connection with the parent company?

A. Of Doseo, not of Dominion Coal. But this little plant helps get over the peak loads.

MR. McCALL (continues)

Mechanization The Company's operations, having due regard to the physical conditions and the type of machines available, are mechanized with the single exception of loading coal at the working face. Man power is still made use of for loading the coal on conveyors or into mine cars after it has been blasted from the face. This is because of two reasons: firstly the peculiar physical conditions obtaining in the Collieries for which no suitable loading machinery has yet been developed; and secondly, the attitude of the workmen who, feeling that loading machines would displace labour, have opposed the installation of such machines in any of the collieries in which conditions would permit their operation. Further information on this subject is contained on an accompanying Memorandum on "Mechanization".

We say there that further information on this subject will be dealt with in an accompanying memorandum, but that will be dealt with later Sir. The Company has the benefit of an expert from the States on this mechanical loading, who is looking into the matter and later will file a report.

BY MR. FRAWLEY - It is not in one of your memoranda?

A. No, it will be submitted later.

BY COMMISSIONER MORRISON - Much later on, Mr. McCall?

A. Yes.



The foregoing memorandum gives in a few words the conditions under which submarine mining is being carried on by the Dominion Coal Company, in Cape Breton, but in order to give a proper understanding of the difficulties experienced in mining under these conditions, it will perhaps be more informative to summarize briefly for comparison the conditions under which our competitors in the United States are producing coal. The data which follow refer in general to all bituminous coal mines in the United States.

In the first place, these mines are working under land areas where the average depth of cover is approximately 400 feet compared to a weighted average depth of cover in the submarine mine of Cape Breton of 1440 feet.

The depth of cover under which coal is being extracted is a factor bearing directly upon the method of development and the cost of maintenance in the mines.

The inclination, or dip, of the coal seams in the United States is much less than in the submarine mines of Cape Breton, the percentage of coal mines having different inclinations being:

	<u>Cape Breton</u>	<u>U.S.A.</u>
Inclinations less than 1 in 28	nil	62%
Inclinations between 1 in 28 & 1 in 14	6%	20%
Inclinations between 1 in 14 & 1 in 8	38%	8%
Inclinations over 1 in 8	56%	7%

BY MR. FRAWLEY - The dip of the coal itself, where the coal is extracted?

A. Yes. With us the inclination less than 1 in 28 is practically nil. We have none of those. So we have much more highly inclined seams in Cape Breton than is to be found on the average in the United States. The average gradient in the Cape Breton mines is 1 in 6.

Q. Are "inclination" and "grade" the same?

A. Yes, one and the same.

MR. McCALL (continues)

In the United States the favorable thickness of the seams and the easy gradients combined with the free use of electricity, possible because of the facility with which





ventilation can be carried on, has resulted in the development of high powered machines for cutting, and more especially in recent years, for loading the coal, after it has been cut and shot down, for transportation to the surface.

BY THE CHAIRMAN - With your splendid system of ventilation, and perhaps for the future to ventilate other mines, you would not have much difficulty in using electrical power in any of the operations, would you?

A. Oh yes Sir, we have to be cautious in that respect. Our mines are quite gassy, as I will show you later on. In the States where they are working under 400 ft. of cover as an average, it is not very difficult to put down a new shaft and give release to your air. But in submarine mining, when you go down No. 1-B you have to hold your breath so-to-speak, until you come up again. There is no relief. The ventilation is a particular point and I was going to deal with that later in a separate brief.

BY MR. FRAWLEY - Is it cheaper to operate a coal cutter by electricity than by compressed air?

A. Yes sir.

BY COMMISSIONER McLAURIN - It is cheaper in the over-all amortization of the operation, the air would be cheaper would it not in a compression operation?

A. There is not much in that Sir. you need large airlines going down and they are quite expensive, and large air compressers to operate. There is considerable loss in friction of air.

BY COMMISSIONER MORRISON - The Capital Cost would be even more?

A. Yes, I think so.

BY MR. FRAWLEY - If you didn't have this gas problem you would electrify your coal cutters in this one instance?

A. We have done that in two mines, and we have showed you how we stepped up our K.W. hours from 5.2 in 1913 to 28.6 in the present year. We are expanding all the time; as





manufacturers in conjunction with people who are working the mines develop machines which are becoming safer and safer.

MR. McCALL (continues brief)

The progressive increase in the use of machinery for cutting, loading and hauling in the United States is clearly brought out in the attached diagram, Appendix No. 2, which also indicates the resulting increase in production per man hour.

We have shown where we have been able to obtain figures for these. Some of them are not right up-to-date, we could not get them any later, but it shows a big rise in the percentage of coal, that is mechanical loading a steady increase, and a steady increase in locomotive haulage and machine cutting, and giving you production per man hour.

BY MR. FRAWLEY - When you say locomotive?

A. That is electric locomotive, as against steam locomotive or horse haulage possibly.

The diagram, Appendix No. 3, shows the "Production in long tons per man employed" in the bituminous mines of the United States, in those of the Province of Nova Scotia, and in those of the Dominion Coal Company. The significant feature of this diagram is that whereas the production per man in the states has almost trebled in the period covered, the production in the Dominion collieries has shown a gradual decline from 2.8 tons in 1905 to 2.37 tons per man in 1940, with a further drop to 1.52 tons in 1944.

The above brief discussion of physical conditions is summarized and compared in the following tabulation, and shows that those obtaining in the United States are much more favorable, and consequently more conducive to lower cost production than is possible in the submarine mines of Cape Breton.



Cape Breton Submarine Mines

Bituminous Mines in the U.S.A.

Entrance to Mines

The shore line is the closest possible opening to the workings. Some workings are now 3.75 miles distant therefrom, entailing a haulage of 4.6 miles underground.

Being under land areas, openings can be made where desired.

Depth of Cover

Mines working under deep cover, average cover 1440 ft. with a maximum of 2250 ft. at present but always increasing. Roof control and maintenance of roadways is a serious problem.

Mines have shallow cover, average depth 400 ft. The problem of roof-control is practically non-existent. Roadways are easy to maintain.

(In making that statement, the problem of roof control is practically non-existent, I am talking of the average. They have some mines where they have bad roof conditions.)

Inclination of Seams

Seams pitching on average 1 to 6, with maximum gradients up to 38%.

62 percent of all bituminous coal won from seams pitching less than 1 in 28. Only 7% of output comes from seams. Pitching over 1 in 8.

Ventilation

Ventilation is a serious problem with increasingly long airways, costly to maintain.

Ventilation simplified by being able to sink relief shafts or make openings where necessary.

Pumping

Drainage from deep mines costly because of high heads and length of discharge lines.

Drainage easily accomplished because of low heads and readily made exits to the surface.

Power Supply

The use of electricity restricted on account of ventilation problems, making it necessary to employ more cumbersome and costly system of compressed air.

Free use of electricity practically unhampered.

Haulage

Steep gradients, ventilating problems, and difficulties of roof control compel the almost universal use of multiple rope haulages with the added cost of transferring cars from one rope system to another.

Comparatively flat gradients permit of the general use of electric locomotives, hauling much heavier trips of cars direct from gathering points to mine mouths or shaft bottom.





Capo Breton Submarine Mines

Bituminous Mines in the U.S.A.

Hours of Labour

Not more, on average, than  
six hours at the coal face.

Seven hours work at the coal  
face.

System of Mining

The steep gradients combined with heavy roof, a resultant of depth of cover, are factors compelling the adoption of the long-wall system.

Flat gradients and freedom from roof control problems allow of workings on the room and pillar system.

Mechanization

Steep gradients, necessary close timbering of working faces and longwall system of mining all combine to make conditions unfitted for mechanical loaders.

Flat gradients, good roof and absence of close timbering allow of ample room at the coal face for unimpeded use of large capacity mechanical loaders.

BY MR. FRAWLEY - We are going to hear so much about this per man day, what do you mean?

A. Per man shift, 8 hour shift.

Q. Is that the underground men? The office staff is not included?

A. No, this is all men who work in the collieries, surface and underground workers.

MR. COMMISSIONER McLAURIN - In effect it covers everybody but Executives?

A. Yes. Not Officials.

BY COMMISSIONER MORRISON - It does cover the underground officials?

A. Yes.

BY COMMISSIONER McLAURIN - Are the over-men included?

A. Yes.

BY MR. FRAWLEY - I think it pretty important to have an exact definition of it, or perhaps you will put it on the record?

A. We will give you the absolute number of men and the classifications of men who are employed, but it does include all our surface and underground employees, including over-men, or up to over-men I should say, and also your colliery office staff.



BY COMMISSIONER McLaurin - Have you an office staff at Sydney that you call a colliery office staff?

A. No, at the colliery.

Q. Localized staff?

A. Yes. The number of people required in that operation out there to turn out output at that colliery.

Q. Without administration?

A. You could not very well get along without your staff there to make up the pays, etc.

Q. When I speak of administration..

A. General office is not included. We have what we call our auxiliary departments, but they are not in it.

BY COMMISSIONER MORRISON - It takes in the men who are at that mine and who are responsible for putting the coal in the box car, as we say in Western Canada?

A. Yes.

Q. Once it leaves there?

A. That is auxiliary.

BY COMMISSIONER McLaurin - That graph is pretty correct, and your comparisons with American mines are done on the same basis?

A. Yes, except that I have learned in the last two days that this tons per man which was given in the Bureau's report for the states of all bituminous coal does include strip mining, and it has pulled it down from 5.6 to 4 point something. I will correct that for you.

Q. And we have to be also careful that the same number of men are employed in shift mines in the States as you are including?

A. Up to 1930 there was not a great deal of strip mining, but there is today.

BY MR. FRAWLEY - Do I understand you have the strip mines in?

A. Yes. The last figure that was given was 5.26, but I will revise that for you.

1. The first

2. The second

3. The third

4. The fourth

5. The fifth

6. The sixth

7. The seventh

8. The eighth

9. The ninth

10. The tenth

11. The eleventh

12. The twelfth

13. The thirteenth

14. The fourteenth

15. The fifteenth

16. The sixteenth

17. The seventeenth

18. The eighteenth

19. The nineteenth

20. The twentieth

21. The twenty-first

22. The twenty-second

23. The twenty-third

24. The twenty-fourth

25. The twenty-fifth

26. The twenty-sixth

27. The twenty-seventh

28. The twenty-eighth

29. The twenty-ninth

30. The thirtieth

31. The thirty-first

32. The thirty-second

33. The thirty-third

34. The thirty-fourth



T. L. McCall

BY ADAM SCOTT - If the Manager gets a man from the colliery to look up his garden, would that be covered in this mandate?

A. Yes, but he would have to get him.

MR. McCALL (continues brief)

General - With respect to the past, present and future aspects of the Coal Mining industry in Cape Breton, the following views of the Chief Engineer of the Dominion Coal Company are excerpted from his submission to the Royal Commission of 1932.

BY MR. FRAWLEY - Was that the Duncan Commission?

A. Yes.

MR. McCALL (continues)

As given, the overall picture is as follows:

"When the final history of submarine mining in Cape Breton comes to be written, it will be divided, broadly speaking, into four periods."

BY MR. JENKINS - Mr. McCall, in the states when computing the number of man shift, do they use the same number of tons that we do here?

A. They are put on the same basis when we make these comparisons Mr. Jenkins, certainly.

MR. McCALL (continues brief)

"First Period:

This occurs when the workings of the already developed land mines, with their comparatively narrow frontage and arbitrarily fixed inter-colliery barrier lines, are projected, without any changes, into the submarine areas under comparatively shallow cover, where 50 percent of the seam has to be left intact in the form of pillars for supporting the bed of the ocean.

Second Period:

Under the above conditions, the workings of these mines have extended very rapidly in the one available direction, viz., seaward, this rapid advance bearing in its train the complicated problems of adapting the methods hitherto employed





to meet the more exacting conditions arising from continuously increasing lengths of transport of men, materials and minerals, longer airways, and the more distant supply of power.

During this period, the workings advance under deep cover where changing physical conditions impose the necessity of changing the method of extracting coal.

Third Period:

This period comes where the present facilities are no longer able to cope with the output, and large capital expenditures have to be made to supplement the existing plant and other facilities for winning the coal.

These expenditures, in turn, warrant greater reserves of coal being made tributary to individual collieries compelling the merging of areas where such are found to be too small, and operations, in general, have to be conducted on a larger and broader scale.

Fourth Period:

The third period will continue until the economic limitations of the methods in use are reached when it will be necessary to abandon such openings and resort to deep shafts, from the bottom of which cross measure tunnels will be driven to tap and win the remote sea coal."

PROSPECTS FOR THE FUTURE

The future is not expected to bring problems which, from an engineering standpoint, might prove insurmountable.

Haulages and transfers may be extended by duplication time and again and/or increased in capacity; means of effective roof support and extraction developed to meet increased pressure. Distance and depth may thus be overcome but the difficulties they entail in the way not only of bringing the coal over long distances to the surface, but in transporting men, materials and equipment and transmitting large volumes of ventilating air and power to remote working sections must be paid for in time and power. The economic aspect is altogether



different from that of pure engineering; it will set the limit to which the field will eventually be worked.

The Fourth Stage in the development of submarine areas, already quoted, to the effect that "it will be necessary to abandon present openings and resort to deep shafts from the bottom of which cross-measure tunnels will be driven to tap and win remote sea coal" is alarmingly near. These shafts will be possibly 2000 to 3000 feet in depth and the tunnels driven from them will meet the coal seams at 3, 4, 5...? miles to sea. Capital expenditure involved in such an undertaking will be tremendous, but will, eventually, have to be faced.

As to the immediate future, little change is contemplated except to take advantage of every suitable means of progressive mining which may offer. With the one single exception of loading at the face, the Dominion Coal Company collieries are fully mechanized today. They lack in that respect only because no loader has yet been developed which will successfully meet the conditions under which their operations are carried on.

I might say at that point that the question was asked yesterday, I believe, of Dr. Gray, if the Company was doing anything in the way of developing a mechanical loader to suit its particular conditions, and Dr. Gray said no, that the Company was not. But the Company is very much in touch with people, manufacturers, who have the facilities for doing the designing and experimental work, keeping in touch with them to find out all the latest developments, and just recently I had a letter from a friend of mine in England who is at the head of one of these concerns, who states he thinks he has something, but he won't tell me what it is yet. It is too new. As soon as something is developed we will know it on this side, but there are a number of people working on this problem. It is a highly specialized business.





MR. McCALL (continues brief)

The Nova Scotia operator is keenly aware of the fact that, faced with such physical conditions as those under which he works and meeting competition from coal mined under more favorable circumstances, he can carry on only through taking advantage of every possible means of reducing cost. Having installed machines of the most modern type available, and having developed methods of mining whereby they can best be made use of, he looks to greater productive effort on the part of labour as the best means at present in sight which may assure the continuance of his industry.

BY MR. FRAWLEY - There is only one thing on page 19 where you speak of the necessity of finding tremendous amounts of capital to continue the operation of these submarine areas. I suppose the position will have to be to either find that capital or abandon the area.

A. Once we get beyond the economic limits of the present methods, that would have to be. It is a very big engineering study that would have to be met.

Q. Dr. Gray told us that there was coal to sea perhaps 7 miles?

A. Yes.

Q. Is it then your contemplation that you can get all that seven miles of coal?

A. It is a long way to go and of course it is a good long way ahead of us yet. When the General Mining Association here first got into submarine workings they had laid their plan, as we can tell now from the papers and letters they left behind them, that once they got one mile out to sea, that that was as far as they could go, and then they were going to draw their pillars back to the shore line. That was back around /60 or /70, I suppose. And now we are out to four miles in one spot. It shows as time goes along, and as people develop new processes and new methods and new inventions come along, they have all tended to strengthen the distance we can go out to sea, and it is very hard to forecast what will be the



absolute limit of it. The biggest problem is the transportation.

Q. You have to keep in mind that you have to sell the coal in competition with American coal, and it looks as if the operators have not the cost problem that you have?

A. That is true.

Q. That raises a very fundamental question?

A. It certainly does. And with the transportation problem, the idea is with these deep shafts, two or three thousand feet deep, that you drop the men down, and there are large tunnels going out horizontally to intercept the seams out to sea. In these tunnels would be fast running trains to take the men out to the seams, from where they would be distributed to the working places by other means of haulage. But these trains would have to be real fast running, regular railways down there.

MR. COMMISSIONER McLAURIN - You are acquainted with Dr. Gray's estimate,  $5\frac{1}{2}$  million tons for 180 years?

A. Yes.

Q. And the 4th phase is included in that?

A. Yes. I am dealing with reserves.

EXAMINATION BY MR. ADAM SCOTT

Q. Could I ask Mr. McCall a few questions at this stage. I note in the first page we have the Independent Mines. I want to clear up some of this because it will come up in the future. First I would like to know what seam is on the Broughton seam, or what seam of coal is at Broughton?

A. Mr. Chairman, these questions I do not think are quite germane to this brief. There is a brief coming on coal reserves.

Q. In the Sydney Mines area, here it just mentions the Indian Cove (page 3). What seams are those three mines on, Indian Cove mines?

A. I mentioned about the Indian Cove seam.

Q. What is the name of the Sullivan mine?

A. What is it correlated with?

Q. What is the name of that seam?

A. It is known as the Sullivan mine.



Q. What is the name of the seam of coal?

A. Could I ask you that question Mr. Scott?

Q. I am not an Engineer.

A. It is possibly on what is known as the Edwards seam, but the correlation of seams on that side of the harbor with those on this side of the harbor is very very difficult, and they have not been completely correlated between the two sides of the harbor. It is known as the Sullivan mine, and some people talk of the Sullivan seam, and other people talk about the Edwards seam. I really don't know which seam it is, that is why I thought perhaps you had some information on it.

Q. Now on page 5, in the middle of the page - "and as mining methods develop to permit of working these seams in a manner acceptable to the miners". What do you mean by that?

A. We are, Mr. Scott, in here at medium or thick seam mining. Our people have been brought up in the Phalen seam and they don't take very kindly to working in a thin seam, that is a low seam. I might instance a case I remember very well in the Old Country a good many years ago. Work got slack in one section where they worked from thin seams and work was plentiful in the Edinburgh collieries where the seam was thick, and the men were sent there, and they didn't like it at all, they were afraid the walls were going to fall in on them, and they wanted to be sent home again. The same holds true the other way around. Men who work in thick seams don't particularly like to work in thin seams. And we have experienced that when we were working No. 10 colliery and we got into long-wall operations there with 3 ft. of coal. The men didn't like it.

Q. What I want to get at is, I noted in Mr. Gray's report on page 77, he says:- "The seams thin out and become unworkable proceeding westerly towards Point Aconi". Now that was the opinion of the Company. You were acquainted with, or should be acquainted with the conditions in Florence colliery. Was it the men, or the Company, that stopped the North Side in the Florence Colliery?





A. I think it was nature stopped it there, Mr. Scott. I can remember places down there where the seam was less than 2 ft. in height.

BY MR. FRAWLEY - "What stopped the north side in Florence colliery" means exactly nothing to the Commission. Can you, Mr. McCall, elaborate on that?

BY MR. SCOTT - I would like to know, does Mr. McCall ever recollect of the men refusing to work in a seam of coal no matter how low it went?

A. I think provided that there was brushing to give them the height, there was no complaint, provided we brushed the rock to give them the height. But there is such a thing as an economic problem and you can't go on taking rock down to give men work on a 2 ft. seam of coal.

BY THE CHAIRMAN - I think the question is if you remember any time when the men refused to work in a mine on account of the small depth of the seam?

A. In Florence colliery, I think it was tied down to.

BY MR. SCOTT - Any colliery at all?

A. I have certainly heard a lot about No. 10 colliery when we were working 3 ft. or a little less, about the inhuman conditions under which we were asking men to work. I cannot remember particularly of Florence.

BY MR. SCOTT - Not to my knowledge do I ever remember any man on the North side refusing to work in low coal.

BY THE CHAIRMAN - You will have to ask that differently, Mr. Scott. You are not giving evidence, you are examining. If you have questions which you think are relevant you should put them in another way.

EXM. BY MR. SCOTT (continued)

Q. What height of coal do you consider unworkable? What thickness of seam?

A. That again Mr. Scott is something that you cannot just say, to give it a height in inches. It depends on the value of your seam. I have worked myself in a seam that the coal was



20 in. in height. It was a particularly valuable coal, they could use it in the blast furnaces without coking, and it commanded a good price. And connected with that there was a fall in stone of 4 in. that came with it; that gave it the 2 ft. in height.

BY MR. WADE - All things being equal?

A. It gives you an economic problem. You cannot fix it at 20 inches.

BY MR. FRAWLEY - I think they said at Minto they were mining from 18 in. up to 24 in.

BY MR. SCOTT - This coal Mr. McCall, that both yourself and Mr. Gray refer to as unworkable, is it the same quality of coal as the thick seams?

A. Which are you referring to Mr. Scott, to what page in my brief?

Q. I am not referring to any page. I am asking, is the value of the thin seam coal the same as in the high seams?

A. I am afraid you will have to refer me to what page I made that statement on, and then I will answer you.

BY MR. WADE - I don't think Mr. Scott said you made that statement. He wants to know if it is the same?

BY MR. SCOTT - Mr. Gray, in his report, said it was unworkable. I want to know if that coal is not as valuable as the workable seam?

A. As regards heat value?

Q. Or any other value?

A. As regards heat value, it probably is.

BY MR. FRAWLEY - You said at No. 10 you heard some complaint. Did you have to cease operations because of those?

A. It is rather a long story, Sir. We did eventually cease operations. No. 10 is not operating.

BY MR. LIND - Was it on account of the complaint of the men at No. 10 that you ceased operations? Or was it because the Company thought it was no longer profitable?

A. Certainly it was not becoming profitable, but at the same





time we did not get any cooperation.

Q. Was that not your reason for closing it?

A. Certainly.

BY COMMISSIONER McLAURIN to MR. SCOTT

Q. Are you taking the position that they should be run when they are not profitable?

A. No, but I am taking the position that it should not be blamed on the men.

BY MR. McCALL - What about when we wanted them to try bottom brushing? There was no one would undertake to bottom brush the mine.

MR. SCOTT - There might have been reasons for that.

BY MR. McCALL - Put it both ways.

MR. SCOTT - There might have been reasons for that too, Mr. McCall.

MR. McCALL then produces a brief on Ventilation of Submarine Coal Mines.

EXHIBIT S/17 - Ventilation of Submarine Coal Mines.

MR. McCALL then presents S/17, as follows:

VENTILATION OF THE COLLIERIES. The ventilation of mines in a submarine coal field presents a greater problem than the ventilation of similar mines in a purely land area where covers are of moderate depth and relief can be obtained by sinking new shafts.

Deep and extensive land mines present a somewhat similar problem to submarine mining, with the exception, however, that new entrances can be made but are necessarily very limited in number on account of the large expenditures involved in shaft sinking.

In submarine development, and the Dominion Coal Company's mines in the Cape Breton field are wholly submarine, the limitation of entrance to the shore line has to be met by the provision of permanent airways of suitable size for the future winning of the submarine coal.



Physical conditions have compelled the Company to construct and maintain upward of 145 miles of airways through which no less than some 930,000 cu. ft. of air per minute are being continuously forced into the workings of eleven mines. The rated capacity of the electric motors driving these fans is 2638 H.P.

The amount of gas generated in all these mines totals some 5,200 cu. ft. per minute, which, if it could be separated out from the air that entrains it, could serve quite a large community. Thus the heat value of this gas, if converted into electricity, would be sufficient to light a town twice the size of Halifax.

A brief description of the ventilation system of No. 1B colliery, of which a plan is submitted, will give a general idea of the complexities in ventilating a submarine mine. On this plan of the workings the intake airways are shown in red while the return airways are shown colored in yellow, the combined length of all these airways totalling 28.7 miles.

No. 1B colliery works the phalen seam which is entered by a shaft 670 ft. in depth, sunk as close as possible to the shore line.

The main ventilating fan which is driven by a 600 H.P. motor is a forcing fan designed to deliver 300,000 cu. ft. per minute. At the present time this fan is forcing 240,000 cu. ft. per minute under a pressure of 8.0 inches of water gauge down a circular shaft 10 feet in diameter located 50 yards from the shore line.

BY COMMISSIONER MORRISON - These old workings will be shut off? It is not giving any gas?

A. It is turned out and goes out at one end.

Q. Have you that sealed off now?

A. No, they are not sealed off.

Q. Do you contemplate sealing off some of that area?



A. No, we do not sir.

Q. Does it interfere with your ventilation there?

A. No, it is rather a help, because in addition to coming up the main return, the air drifts through these old workings and cuts out some friction.

BY COMMISSIONER McLAURIN - That is all pillar system?

A. Yes; without the pillars being room.

BY COMMISSIONER MORRISON - Is there a certain leakage of gas from these old workings?

A. The fresh air goes in and down and splits up and the return air goes through these old workings.

Q. What percentage of gas would you find in your out-take at the shaft?

A. .7.8

Q. How does that compare with these workings down 1B?

A. You get in some places more than that in air, you get 1%, and we had a little trouble down at No. 5 auxiliary deep. We went over that once and had to stop a section. We have some new connections there.

Q. I can quite readily see where your difficulty would be at that point?

A. The intake shaft is up at 1B and there is also return of the hoisting shaft there; it is 38 x 13 approximately, 10 ft. in diameter. We are going to supplement that soon by an additional intake. The return air goes up 1B and drifts up to 1A. After we start now following the air from the fan it is forced down the shaft and at a point 200 ft. down the shaft from the surface.

MR. McCALL (continues brief)

At a point 200 ft. down the shaft from the surface the air is split into two currents, one split travels in an overlying seam, the Back Pit seam (it runs from 1B shaft into the Back Pit seam and rejoins the Phalon seam at No. 1 Auxiliary Deep there), and the other split continues to the





the shaft bottom where it is conducted by two main intake airways, each 2,200 ft. in length, driven in the Pholan seam and running parallel with the main haulage. At the end of this distance these two airways connect with the main motor level which from this point onwards also serves as an additional intake airway.

Thirty-eight hundred feet from the shaft, the airway in the overlying Back Pit Seam connects with the above main airways in the Pholan seam through an inclined tunnel, and from this point, the air is coursed through four interconnected airways having a combined area of 300 sq. ft., to No. 5 Deep, distant 2.1 miles from the pit bottom. Here the first split amounting to 70,000 cu. ft. of air per minute is taken off for No. 5 Deep. This air eventually joins the main return after having travelled a circuit of five miles in this section.

BY COMMISSIONER MORRISON - Does the Mines Act of this Province permit the use of booster fans?

A. Yes Sir, with the permission of the Department.

Q. Are they used to any extent?

A. At present we have a small one at the bottom of No. 5 Auxiliary Deep.

Q. They are not a general practice in submarine mining?

A. Not generally, but we have been gradually compelled to do it. We have one in No. 4 colliery.

Q. What has been your experience with them?

A. Very satisfactory. They help to cut down leakage, which is one of the bugbears.

MR. MCCALL (continues brief)

The main body of the air continues travelling beyond No. 5 Deep until at a point 2.7 miles from the shaft bottom a second split, this time of 26,000 cu. ft., is taken off for No. 26 Mine, a mine working the overlying Harbour seam through a cross measure tunnel.

The remainder of the main body of air, now reduced to some 70,000 cu. ft., continues onward until at a point 3.6



miles from the shaft bottom it reaches No. 7 Deep where it courses a distance of 2.9 miles round the workings before entering the main return at the top of No. 7 Deep for eventual release to the surface.

The several splits of air that ventilate their special sections thus come together again in the main return airways which consist of two parallel airways some 4.6 miles in length leading out from the workings to the main hoisting shaft at No. 1B colliery, and also to No. 1A shaft, which is distant some 2 miles from No. 1B shaft.

The velocity of the return air, and consequently the friction opposing the flow of air is kept as low as possible by allowing the return air to course through the old workings surrounding these two main return airways.

That is, you have the two main return airways shown in yellow there, and we allow the air to course through these old workings too.

Approximately 50% of the total amount of air entering No. 1B mine is released to the surface again through No. 1A shaft.

The longest single coursing of the air is to and from No. 7 Deep section where the air travels a total distance of 11.9 miles before it reaches the surface at No. 1A or 10.1 miles through No. 1B coal shaft.

The shortest single coursing of the air is in No. 26 colliery, a comparatively new section where the air travels 6.9 miles from the time it leaves the surface until it returns there again.

The above description has dealt with main splits only and small splits of fresh air taken off to ventilate electric installations and such like have not been included. It must also be pointed out that in all mines a certain amount of inevitable leakage takes place where there are doors and stoppings controlling the coursing of the air.





That is the coursing of the air in these mines, and of course a continual check is kept on the proper ventilation. The gas is checked by the Officials underground using the safety lamp, and in addition we are continually sampling the air down below and having it analyzed.

BY COMMISSIONER MORRISON - Have you a dust problem?

A. Yes.

Q. Do you engage in any rock dusting?

A. Yes, excessively. We have a rock grinding plant at No. 1B Colliery for making this dust, and from this plant we supply all the collieries of the Corporation, and we are handling about 12,000 tons of rock a year there; grind it up into dust.

12:10 P.M. HEARING ADJOURNED UNTIL 2 P.M.



AFTERNOON SESSION, JANUARY 19

The Commission resumed its sittings at the Court House, Sydney, N.S., at 2.00 P.M.

T. L. McCall: I am handing in this memorandum on coal reserves.

Marked Exhibit S/18 - Dominion Coal Company Ltd.  
Memorandum on Coal Reserves

The only reserves of high quality coal available to the Dominion Coal Company Limited are those remaining in the submarine areas seawards of the present workings, the single exception being the area at Lingan which is being held for a new colliery when such is required. The accompanying plan, that is the plan attached to the brief, shows the division of the sea frontage between the different operating collieries and the conjectured limit of seaward advance of these workings.

These limitations consist of either excessive depth of cover, 4000 feet is assumed to be the maximum depth of cover under which mining can be carried on, or excessive distance off-shore, the maximum distance for this purpose being taken at five miles.

BY COMMISSIONER MORRISON: Didn't you say something about 11 miles this morning?

MR. McCall: No sir. There was a discussion as regards seven miles, whether the seam would proceed, and I said that I thought most likely it might, though I couldn't say how the quality or the height would be, but in taking this I am taking, as I say further on, what might be called pretty certain reserves of coal, things that are more or less definitely established, we would think.

BY COMMISSIONER MORRISON: What Dr. Gray would refer to as "intelligent speculation"?

MR. McCall: Intelligent speculation is correct. Attached to this memorandum is a statement giving an estimate of the possible recoverable tonnage of coal under the above con-



ditions, together with the corresponding expectancy of life of these mines. In making these estimates it has been necessary to assume that the coal seams maintain their present characteristics for the distances indicated.

BY COMMISSIONER MORRISON: At that point, the Phalen seam is what the Dominion Coal Company regard as their best seam, don't you?

A Not necessarily, no. It is a very good seam of coal but the Harbour is a very good seam of coal too, with different characteristics. They are both excellent.

Q Now you have worked the Phalen seam both as a land mine and as a submarine mine, have you not?

A Yes.

Q Now how do the coal places in the Phalen seam in your land mine and your submarine mine compare as to quality and quantity?

A Going straight out to sea there has been no change to my knowledge in the quality of the coal or--I was going to say the height too but the height varies in a north and south direction, or an east and west across that way on that plan, and the quality of the coal remains the same up as far as New Waterford, that is in the Phelan seam, but going out to sea we have not detected any change in the quality of that seam. It looks just as good today as it does on the shore-line.

Q It is as good today as it was when you were working it as a land mine?

A Yes, but the changes that do take place, in following the shore along we find changes in the height of it.

Q But they are not of a serious nature?

A Well, after leaving New Waterford, yes, because the Phelan seam fingers out under Sydney Harbour into a number of thin little seams.

Q But in this 1B that condition does not apply?

A Does not apply.

Q You have the same thickness of the seam there that you





did on the shore line?

A The same thickness.

Q And the same quality, if not better?

A I would like to be able to say that it was better but I think it is just the same, because it is very hard to improve on a good article.

Q It is also pretty hard to spoil a rotten egg.

A Exactly. I answer your question here. So far no changes whatsoever have taken place in the distances covered. Thin seams of coal or seams yielding coals of greatly inferior quality have not been included, such as the Back Pit or Boutilier Seams, to mention two of the seams most persistent over the area.

The total estimated tonnages of high grade coal shown in the statement is 402 million tons, which would keep these collieries going for another ninety years at an annual output of  $4\frac{1}{2}$  million tons.

I have not gone quite so far as Dr. Gray did in his limit out to sea but I am considering things that we might say look like pretty definitely sure reserves of coal for that distance, and after all, dealing with it for ninety years I think we have gone a good long way ahead.

BY MR. FRAWLEY: Have the Company anything as well considered as this in respect to anything but Dominion Coal?

A We have an article on Nova Scotia Steel & Coal.

Q What about Cumberland and Acadia?

A That was really dealt with in Dr. Gray's brief. I was confining my remarks more to the submarine area.

#### Other Coal Reserves

The yield from the Gardiner Seam has not been included in the above for the reason that although the coal from this seam is at present of moderately good quality, test boreholes have shown that this quality deteriorates away from the present opening.



The foregoing estimated tonnage of reserves must not be confused with other figures dealing with coal reserves as the estimates given in this memorandum refer to what might be classed as developed reserves. There are other areas, however, which have not been included in arriving at the above figure for the reason that the quality of the coal is very definitely inferior to what is now being mined. Again there are still other areas, now inaccessible, that may or may not contain seams of coal worth working.

A good example of this latter condition is the extension of the Harbour and Phelan Seams east of No. 4 Colliery and so far as the anticline at Cape Percy, where the outcrops of both seams leave the land area at Donkin and plunge under the ocean and nobody has as yet been ingenious enough to devise a method of prospecting such areas.

You see there is a blank space left after leaving the area of the outcrop of the Emery seam and No. 4.

BY THE CHAIRMAN: Is that the old No. 6?

MR. McCALL: Yes. No. 6 has stopped. No. 4 is taking that area. You will notice while we are on that that this plan shows a division for the sea frontage. At Sydney Harbour you will notice the inter-company barrier on the plan and then to the east of that you get the 3 miles of a sea frontage which is being worked by No. 12 and No. 16 collieries. The green coloring on this plan represents the workings in the Harbour Seam; the red represents the workings in the Phelan Seam, and then next door to that is a 3 1/4 mile reserve, or the Ligan area, which we are reserving for a new mine when occasion warrants, and then next to that comes No. 1B Colliery with a 4 1/4 mile frontage, and under 1B you see a little green line, which is the beginning of No. 26--in the acorn stage still--and then No. 2 workings in the red is closed off going seawards. This was the re-allocation plan and the area that was being worked by No. 2 is now being divided between No. 1B and No. 4 colliery.





BY COMMISSIONER McLAURIN: Then there is the blue?

MR. McCALL: The blue is the Emory Seam. The purple was the Hub Seam, the topmost seam that we now have, and the yellow is the Gardiner seam.

BY THE CHAIRMAN: You connected No. 4 up with some other colliery?

MR. McCALL: It is getting a wider sea frontage through stopping No. 2 Colliery as a producer of Harbour Seam coal. No. 20 Colliery, which is developed out of No. 2 Colliery, is going to work the Harbour Seam and we have dropped the Phelan Seam altogether in No. 2 now. That is the re-allocation plan that is described in Dr. Gray's brief.

BY MR. FRAWLEY: What is the significance of the 3 miles in the case of No. 12 at Waterford and  $4\frac{1}{2}$  miles for No. 1B? What is the significance of that?

MR. McCALL: We distributed this area in what we considered to be the best engineering of that sea frontage, No. 1B being eventually slated for being a bigger output mine than No. 12 and 16.

Q This was done from the standpoint of good engineering and perhaps for separating costs?

A No, engineering. You do consider costs, of course.

Q What is the significance of the inter-company barrier?

A These are Dominion Coal Company leases on this side of the line and those are Nova Scotia Steel and Coal Company leases on the other side of the line. There is no actual barrier; the coal goes right across here. We leave a barrier of 500 feet separating the Scotia areas from the Dominion areas.

Q Suppose they were just called Dominion Steel and Coal. Would that make any difference to the engineering? Would you still have the barrier there?

A We would still have the barrier there. Engineering has come into that barrier too. There was a rearrangement of areas to the advantage of both companies.



BY COMMISSIONER MORRISON: Aren't they operated by the same management?

A No. The Nova Scotia Steel and Coal Company holds leases on the north side of the harbour, Dominion Coal Company holds them on the south side.

BY THE CHAIRMAN: The areas under Sydney Harbour, those are not considered submarine, are they?

A Oh yes, we consider them submarine. Anywhere where we would be liable to get an inundation of water that we couldn't control we consider submarine.

MR. McCALL continues memorandum: A combination of the above two conditions, i.e., inferior quality and inaccessibility, is found in the Morien-Birch Grove district, and as a good deal of publicity has been given at different times to the opening of new mines in this area, the following information is supplied to dispel any false ideas that may be abroad.

Morien-Birch Grove Area

The productive measures in this district are contained in a narrow synclinal fold running in an east and west direction. The axis of this syncline dips gently to the east where it enters the submarine area at Cow Bay. The measures are highly inclined on the northern flank of the syncline but on the southern flank return to the surface on a gentle gradient.

Section

The seams in this area as proved by boreholes or otherwise are:-

Blockhouse Seam	9'-0"
Strata	570'-0"
Gowrie Seam	5'-7" to 4' 10"
Strata	250'-0"
Three Foot Dirty Seam	3'-0"
Strata	100'-0"
Spencer Seam	2'-10"
Strata	85'-0"
Four Foot Dirty Seam	4'-0"
Strata	215'-0"
Long Beach Seam	1'-10"

BY THE CHAIRMAN: Does the Dominion Coal own all those areas?

A Yes, in that syncline there it does.

Q Well, Long Beach Seam. There are some other supposed areas there?



A We are not holding any out at Cape Morien but the Long Beach Seam where it outcrops on the northern flank of the syncline comes into our leasehold.

Q I remember some years ago there was an operation right in the centre of the village there, by Pearsons, I think it was.

A Atlantic Collieries, I think.

Q Were they operating Dominion Coal areas?

A Well, these are areas that we hold now.

Q You didn't hold them at that time?

A I don't believe so. I am not quite certain but I could find out for you. I think we acquired them later.

Q Were those areas owned by Dominion Coal when Atlantic Collieries operated them?

A Before the Dominion Coal Company was formed?

Q Oh no, in 1911, 1908.

A I will find out.

Q The reason I ask, there was some idea that one of the companies that operated there operated in a very poor manner, made it quite difficult to gain the coal in the submarine areas there.

A They started to sink a shaft one time but they never got it down. Is that what you have in mind?

Q No, it was some information I picked up in the Mines Department the other day.

A I think possibly that was the old Atlantic, sir, because they went very near the outcrop in the submarine area and there was supposed to be water seeping in.

BY MR. FRAWLEY: As far as your holdings are concerned do you want us to assume that all of the holdings on this map are in your company?

A No sir, not all of them; not in the blank areas here. We can submit a plan of our holdings.

Q It might be superimposed on this for ready understanding?

A We will submit another plan for the Commission showing where the backline of our leasehold runs.





Morien-Birch Grove Area  
Blockhouse Seam

That is the one colored green in that Morien section. This seam yielded an excellent quality of coal, but only a small area underlay the land area and this has been completely worked out. The seam where it dips under the sea is lying under too shallow cover to permit of its being worked, but should the axis of the aforementioned fold continue to dip in the submarine area as it had done in the land area, and should the seam continue to hold its height and quality, then the minimum depth of solid cover over the Blockhouse Seam at which mining could begin could not be reached under a distance of two miles off-shore. In the course of the next mile seawards there might be one and a quarter million tons of coal that could be worked.

Perhaps that is clear; I don't know; but the Blockhouse Seam is lying under shallow cover and where it goes under the ocean there it is under too shallow a cover to enable us to mine it. We have to have 180 feet of solid cover over our workings before we can begin mining and we haven't got that, and we don't reach a point where we have enough cover until we are two miles out at sea.

At present there is no known method of determining the depth of cover, or quality of coal of this remote seaward area. That is one problem which if it could be solved would be followed by the second problem of the very large expenditure involved in shaft sinking on the land area and driving tunnels to intercept this seam at the assumed point some two miles out to sea.

BY MR. FRAWLEY: Have you delimited the submarine extension of the Blockhouse Seam?

A Only by intelligent estimation, shall we say, of what might happen underneath. That is, we have to assume that the axis of the syncline there would continue dipping out to sea at no less than the present rate. If that occurs then it is two miles out to sea before we can begin to work that seam.



- Q And that goes for the whole of these submarine operations?  
There is no way of delimiting it actually by boreholes?
- A There is no way of testing it; we don't know what is out there.
- Q That is one of the difficulties, you might have a lot of coal or not much coal?
- A As Dr. Gray said, there may be other seams out at sea that are outcropping on the bed of the ocean that we know nothing about.
- Q But your whole operation is speculative? You have to put yourselves to enormous expenditures before being absolutely certain how far that coal goes out to sea?
- A Yes. Of course You heard all the evidence given of the geological work and that has been of enormous assistance to us in formulating ideas of the probable extent and recommending as engineers to the directors that such and such should be done. Here I can't say that the coal would be found.
- Q Has Dr. Bell made any particular examination of the extension of this Blockhouse Seam?
- A He made an examination and report of the whole of that district, sir. It will be in Dr. Gray's brief, I think.

Morien-Birch Grove Area  
Gowrie Seam

This seam has been worked by the following collieries, naming them in their order from west to east:

Dominion No. 21

Dominion No. 22

Old Gowrie Mine

North Atlantic Collieries

Nos. 21 and 22 Collieries have completely worked out all the coal between the two outcrops, but to the north of the old Gowrie workings and in the neighborhood of the Atlantic Collieries it is estimated that there may be some  $3\frac{1}{2}$  million tons of recoverable coal in the land areas. The seams on the northern flank of the syncline are highly inclined and pitch up to  $43^{\circ}$





and the most of the above tonnage lies in this northern flank. Such steep inclinations require changes from customary district practice in the recovery of coal.

In the North Atlantic Collieries, it is estimated there might possibly be seven million tons of coal to be worked. In these areas the height of the seam has declined from 5'-10" as mined in No. 22 Colliery to 4'-10" and this latter height includes a clay band six inches in thickness which made its appearance in the seam about two feet above the pavement.

Similarly the ash and sulphur contents in No. 22 Colliery were 8.6% and 3.06% respectively. The average analysis of several samples taken from Atlantic Collieries are shown below, and can be compared with the average analysis of the present Dominion output.

	<u>Gowrie Seam No. 22 Colliery</u>	<u>Gowrie Seam North Atlantic Colliery</u>	<u>Average Dominion</u>
F. C.	55.61	53.64	57.0
V. M.	35.79	34.76	35.0
Ash	8.60	11.60	8.0
Sulphur	3.06	6.13	3.0

BY MR. FRAWLEY: There is a pretty close analogy between Colliery No. 22 and average Dominion?

MR. McCALL: There is a trend as you are going east there for the seams to deteriorate in quality and the same is being expected on the other side of this incline that you see marked on your map, that the seams are deteriorating in quality, becoming higher in ash and higher in sulphur.

BY MR. WADE: Am I correct in thinking that you have someone else who is going to discuss the question of the possibility of washing that coal?

MR. McCALL: I don't think. We haven't planned on Mr. Brown dealing specifically with this case but no doubt he will explain to you that certain seams have inherent ash that you cannot wash out. It is foreign matter really that you wash out of seams.

MR. WADE: Well, we can leave the question.



Morien-Birch Grove Area  
Spencer Seam

The only seam below the Gowrie which shows any sign of promise is the Spencer Seam, and I might say that this district was very thoroughly prospected. This seam has never been worked, but has been prospected by means of boreholes, proving approximately 13 million tons of workable coal. The average height of the same was shown to be 2 feet 10 inches, the coal having an average analysis of:

Fixed carbon	52.94%
Volatile Matter	37.33%
Sulphur	4.37%
Ash	9.73%

This seam would appear to yield a better class of coal than what remains of the Gowrie seam, but the thinness of the seam is a serious factor when considering it as a commercial proposition.

Mullins Seam

In the Glace Bay district deep boreholes probing the structure of the field found the Mullins seam horizon consisted of thin streaks of dirty coal.

This seam underlies the Phelan seam by an interval of some 900 feet and is the lowest known seam of the Glace Bay-New Waterford district. The outcrop of the seam reaches its maximum development in the New Waterford district. Nothing is known about the behaviour of this seam at depth.

BY COMMISSIONER McLAURIN: I don't see that one.

MR. McCALL: It is in the New Waterford district

Q Well, that hasn't anything to do with this Morien?

A No, we finished with Morien.

MR. McCALL continues: West of New Victoria the outcrop of the seam submerges and its next appearance on land is at North Sydney on the opposite side of the Harbour.

The Candy Pit at North Sydney was sunk in 1928 to work this seam, but after a short career during which only 48,000 tons were mined, the colliery closed down and has not been re-opened.



BY COMMISSIONER MORRISON: Who was that operated by, the Candy Pit?

A Northside Collieries I believe was the official title of it.

Q It was not Dominion Coal?

A No, it was an outside company.

MR. McCALL continues: The height of the seam proved to be 5'-7" including a clay band 5" in thickness. Other clay bands also occurred irregularly in the seam. The product from this mine was unquestionably of low grade.

BY COMMISSIONER MORRISON: I suppose the Nova Scotia Government would have an analysis of that?

MR. McCALL: I think the Department of Mines will give you an analysis of that.

The information obtained by prospecting the outcrop of the seam near New Waterford plainly showed that out of the seven feet making up the height of the seam, some five feet might be mined to yield a coal having an ash content of not less than 11 per cent. The sulphur content would be at least 6 per cent and the heat value approximately 13,000 B.T.U. The samples from which the above results were obtained were taken from near the outcrop but sufficiently far away from the weathered coal at the crop to be truly representative of what the seam would yield. As already stated, nothing is known of the behaviour of this seam at depth, but at the same time one may venture to predict with a very reasonable degree of accuracy that this seam should show a fairly rapid further deterioration from its present quality as it is followed to depth, and I might say I am basing that reasoning on what has occurred in the Glace Bay district, and as pointed out already that these seams were laid down in a saucer-shaped depression and that the seams at the bottom of the depression had the smallest areas of workable coal in them. This is low down in the series.

BY MR. FRAWLEY: When you say that, the Phelan seam is low down. Isn't Phelan on the bottom?





A Oh no. Taking these ones here, at the very bottom you have the Mullins and then you have the Gardiner over that, and over that you have the Emery, then you come to the Phelan, then the Harbour and the Hub.

Q All the better seams?

A The higher you go up in the series the wider the extent in the deposition.

Q But not necessarily better seams?

A No.

Q You say nothing is known of the behaviour of this seam at depth?

A No.

Q Could you not drill?

A It could be drilled but the results on the surface were not very encouraging, shall we say, to put it mildly, and we have no occasion to work coal of that nature at the present time and we have not done any prospecting on it.

Q I mean that is not a submarine problem? It could be drilled to depth?

A It could be drilled to considerable depth, and I might say that these seams that we look on now as second quality seams, the day will come when these will be worked.

Q That would be a land mine?

A It would be a land mine to begin with but it would eventually if it persisted also go submarine.

Q You spoke about the seams deteriorating as they went east in the Port Morien area. Do they deteriorate as they go in the opposite direction?

A Well, they group together here.

Q So it is just a matter of one direction?

A Yes, one direction.



NOVA SCOTIA STEEL & COAL COMPANY

This Company holds coal leases on the north side of the Harbour and has sub-leased a certain number of them to Old Sydney Collieries who operate Princess and Florence Collieries.

The reserves of coal for Princess and Florence lie in the Harbour seam in advance of the present workings. This seam is continuous under Sydney Harbour and is the only one of the seams of the Sydney coal field worked in the Glace Bay and New Waterford areas that does not split up or disappear as a recognizable seam after proceeding westwards under Sydney Harbour. The Harbour seam becomes of diminished height proceeding north-westerly. This tendency of the seam to thin forms an unknown boundary to the workings of Florence Colliery, which to date tends to curve across the main deep of Florence Colliery. There are no means of determining along what line of boundary the Harbour Seam may thin except by persisting with development so long as the seam is workable. This is what is being done.

BY COMMISSIONER MORRISON: The company holds leases on the north side, that is the Nova Scotia Coal & Steel?

A Nova Scotia Steel & Coal.

Q And they in turn sub-lease them to the Old Sydney Collieries Limited?

A Yes.

Q Now is the Old Sydney Collieries Ltd. not a Dosco group?

A Yes.

Q They are a subsidiary company?

A Yes.

Q And the Nova Scotia Steel & Coal is also a subsidiary?

A. Yes.

Q And the Scotia lease from the parent company?

A Oh no. The Nova Scotia Steel & Coal has these leases in its own name and it sub-leases them to Old Sydney Collieries.

Q And does the Nova Scotia Steel & Coal Company operate the mines over there?

A No sir, the Old Sydney Collieries operates them.





Q And you are the engineer for them?

A I do engineering for Old Sydney Collieries, amongst other things.

BY MR. JENKINS: Can I try and get that straight in my mind?

The lease is held by the Nova Scotia Steel & Coal Company who in turn sub-leases it to the Old Sydney Collieries?

A Yes, the Nova Scotia Steel don't operate them.

Q And the Nova Scotia Steel & Coal are a subsidiary of the parent company?

A It is all part of the family.

BY THE CHAIRMAN: Subsidiary in the sense that they own the common stock of Nova Scotia Steel & Coal.

MR. McCALL continues: Projecting a boundary for the thinning of the Harbour seam and estimating the seaward gradients of the strata, from all available data, it is then assumed that provided the Harbour Seam maintains its thickness and quality as far as the five mile off-shore limit, there are 42 million tons of recoverable coal that would provide for the continuation of the present output for another 65 years.

#### Other Reserves

There are other reserves of coal, but as the crops occur moderately close to the shore limit and the seams dip under the ocean, the continuance at depth is at present an unknown quantity.

BY COMMISSIONER MORRISON: Have you made an examination of the outcrop of these seams?

MR. McCALL: Yes sir. I will deal with that now. The Hub Seam which contains reserves of good quality coal on the south side of the Harbour is represented at Cranberry Head near Princess Colliery by a series of thin seams, at least eleven in number. Boring upwards from the Harbour seam has shown this split-up condition of the seam as persisting in submarine areas to a point 12,000 feet north-east of Cranberry Head.

It is believed that the splits of Hub Seam come together in the Boularderie Island area as the Stubbart Seam. There may be a substantial reserve of submarine coal in this vicinity, but



nothing is known of the nature of the Stubbart Seam as it proceeds seawards from its outcropping across the tip of Boularderie Island. Now these are suppositions that those seams are coming together, but they are fairly well reasoned out by Dr. Bell and other geologists who have studied the matter.

Two seams are known to be present above the Stubbart Seam (Hub) namely Lloyd's Cove or Bonar Seam and Point Aconi Seam. This latest named seam has only a fragmentary outcropping (now denuded) at the tip of Point Aconi. It can be ignored as a source of mineable coal at this time as really nothing is known of its submarine extent or nature.

The Lloyd's Cove seam (which is present on Point Aconi as two seams of inferior quality) has been mined intermittently since 1870, but its quality has not been sufficiently good to enable it to be marketed along with Harbour Seam coal.

The seam has been worked by the No. 2 Colliery of the Nova Scotia Steel and Coal Company, which after a chequered career of openings and closings was finally closed in 1915. It was also worked at Bonar Head, work there being discontinued in 1923.

In view of the uncertainties that surround submarine mining, uncertainties such as quality and height of seam and the possibility of inundation as well as disaster, it is essential in this as in other fields that the reserves of coal should be developed in a properly planned and orderly manner as occasion requires.



BY THE CHAIRMAN - Mr. McCall, where is that No. 2 colliery, that is on the North side, where is that old colliery?

A. It was near Princess on the shore line there.

Q. It is just a small one?

A. Yes. It opened and shut. If there was a very brisk demand for coal they could get past with it.

BY MR. FRAWLEY - This colliery of Jubilee, is that on the map?

A. It is contained in there, but it is not shown.

Q. Is it between Florence and Princess?

A. Yes.

MR. McCALL IS NOW SWORN, but only as regards facts.

EXAMINED BY MR. SCOTT

Q. Mr. McCall, I see No. 11 colliery here is listed for 4 years?

A. Yes, Mr. Scott.

Q. Would you give us the reasons?

A. The reason Mr. Scott is that I do not believe that the Emery seam extends beyond the limits that will be worked out in 4 years time.

Q. Is that including East side?

A. I am not counting the East side into that estimate.

Q. I would like to know, why are you not including the East side?

A. The coal on that side of the mine, the seam on that side of the mine is thin, Mr. Scott.

Q. Then seam coal?

A. Yes, thin.

Q. When you say thinness, what thickness would you mean?

A. Below 3 feet.

Q. Do I understand at present it is 3 ft. high?

A. At the entrance it was 3 ft. and a short distance in it diminished, and a little further in it got down to 20 inches. There is a thinning in that direction.

Q. Would you say that the Company has definitely decided they won't work any coal that reaches 3 ft.?





A. If we can work it economically we will, but we have not been encouraged up to date to do so.

Q. Are your company prepared to negotiate to operate this seam?

A. What do you mean?

Q. Would you discuss this matter with the Union?

A. Certainly.

Q. To keep this mine open for much longer than 4 years?

A. We are willing to discuss it with the Union if they are willing to put their shoulders to it and do their part. But, as explained before Mr. Scott, the reactions which we received to trying to work these thinner seams of coal, were not at all favorable.

BY THE CHAIRMAN - Are those the seams of coal that you need mechanical devices for?

A. It would be assistance.

BY COMMISSIONER MORRISON - Is this No. 11 fully mechanized?

A. No sir, it is not. We are working Room and Pillar with radio cutters and compressed air drills.

Q. What is the extraction per man at the coal face, not the over-all picture, but at the coal face?

A. 3.38 tons this year, to date at the coal face.

Q. Have you the overall picture?

A. The overall tons per man?

Q. Yes?

A. This year to date, 1 ton.

EXM. BY MR. SCOTT (continued)

Q. You say Mr. McCall here on page 7 (Nova Scotia Steel & Coal Corporation brief), you say "The Nova Scotia Steel & Coal Company subleases to the Old Sydney Collieries of Florence and Princess. Who subleases to the Independents?

A. In that district?

Q. Yes?

A. Nova Scotia Steel & Coal.

Q. Who subleases to the Independents at the point Aconi area?



A. Are there any Independents there, Mr. Scott?

Q. I am asking you a question. Who subleases to the Independents at Point Aconi?

A. Are there any there?

Q. I don't know the names of many, but I know there has been a large scale operation there for thirty or more years.

BY COMMISSIONER McLAURIN - Don't you know the names of all those companies?

MR. SCOTT - No. I understand they are under the bootleg system.

BY COMMISSIONER MORRISON - Hence the secrecy of their identity.

BY MR. FRAWLEY - Does District #26 have a contract with the Bootleggers?

MR. SCOTT - No.

EXM. BY MR. SCOTT (continued)

Q. Are you aware of this operation there, Mr. McCall?

A. I don't know particularly which operation you are referring to, Mr. Scott.

Q. Point Aconi?

A. That is a district.

Q. Boularderie Island?

A. I am asking you if you would name a person.

BY THE CHAIRMAN - You would not be subleasing to bootleggers?

A. No. We have endeavored to stop this, but it is a hard thing to do.

MR. SCOTT - There is a community there of 3000 people.

BY MR. FRAWLEY - At Point Aconi?

MR. SCOTT - Yes. Both Mr. McCall and Mr. Gray have said that the coal peters out there. I would like to know if Mr. McCall knows the height of coal at Point Aconi.

EXM. BY MR. SCOTT (continued)

Q.. Mr. McCall, do you know the height of coal at point Aconi?

A. I have seen it in places, Mr. Scott.





Q. What height?

A. Five feet.

Q. Would there be any six feet?

A. I can't answer off-hand without looking up records. Some of the coal was none too good, and some was not too bad.

Q. Have your surveyors been in that district surveying the coal that has been taken out of that district?

A. Yes, surveyors have been out in the district.

Q. And could you give any reports to this Commission as to results of that?

A. Just what are you asking me to report to the Commission? It is all awfully vague, this.

BY MR. WADE - Mr. Scott wants to know the results of any surveys or examinations that were made there, any borings, in this area to which he refers, and he would like you to present the results to the Commission.

BY MR. McCALL - If the Commission would like them, I will give them all the data we have.

BY MR. SCOTT - That is what we want, because there are 3000 people there to be protected.

BY COMMISSIONER MORRISON - Is this a legitimate coal mining operation carried on under the mining laws of the Province of Nova Scotia, and how many men are employed there? The information is certainly not clear to me, and now that the question has been raised, I think the Commission should know about it.

BY MR. SCOTT - If I had my barn full of coal, I would know if there was somebody stealing it.

BY COMMISSIONER McLaurin - Mr. Scott, I think we should keep this done to you asking questions of Mr. McCall.

EXAMINED BY MR. JENKINS

Q. Have you any late report, Mr. McCall, from your surveyors as to any extraction of coal from the areas of the Point Aconi district?

A. No late reports. I just can't remember when we had an examination last made and a report last made on this. I would



have to look my files up to ascertain that.

Q. Have you any report by surveyors as to extraction of coal in that area?

A. Certainly.

Q. Legitimate extraction?

A. No.

Q. The extraction then would be of a bootleg nature, so-called?

A. On that side of the water, as on this side of the water, we are continually trying to stop it, and there should be no occasion at the present time for bootlegging.

EXM. BY MR. SCOTT (continued)

Q. If this work goes on and the ocean is tapped, what would happen that area?

A. It will be just too bad; it would flood that area, naturally.

Q. Was there any preparation made in your history of the mining operation there of running a railway track to point Aconi to get that coal, by the Nova Scotia Steel & Coal Co.?

A. Any plans?

Q. Yes.

A. I would need to look that up in the files and see. Not in my day.

Q. Would not the present old road going to Florence, was not that the railway that was built for Point Aconi?

A. No, I don't think so. I think there was some question of opening up where the Alexandria Pit was opened up.

Q. In your report here I do not see any report of any tunnelling to be done on the north side to tap the Lloyd seam?

A. If you had read this Mr. Scott you would have seen that I reported that the Lloyd seam is definitely of uniform quality.

Q. How long did No. 2 work in the Lloyd seam?

A. It worked intermittently and it was closed down finally in 1915. It was a question of opening and closing. When times were very good in the coal market and there was a very brisk demand, people opened it up and kept it going until times were not so good, and then they closed it down, and the same cycle



repeated itself. That is beyond my day, but the information is what I can extract from the records.

Q. Can you say within 45 years?

A. I would have to look it up. I would not say continuously for 45 years.

Q. Your date here is 1870, and closing is 1915.

Q. Where did I say that?

A. On page 2.

Q. I didn't say that. I said the Lloyd Cove seam has been mined intermittently since 1870. I didn't say No. 2 mine had been.

Q. Now coming back to the leases again, subleasing, who gets the depletion?

A. That will have to be answered by the Accounting Department. I am not operating over there Mr. Scott. I am only mining engineer for it.

Q. Could you tap Jubilee seam from Florence colliery by tunnel?

A. Can you tell me if the Jubilee seam exists there?

Q. I don't know, but I will ask you, does it exist there?

A. I very much doubt its existing.

Q. What was the result of your borings in Princess?

A. Negative.

Q. What was it for Lloyds?

A. We didn't go up to the Lloyd Cove.

Q. Did you bore in Florence for the Jubilee seam?

A. No.

Q. I suppose there is a possibility that it could be there?

A. I very much doubt it.

Q. You have Florence here for 34 years, and what is the prospect of going (according to this map) going north in the Florence seam?

A. The prospects of going north? Well you see what I have put down there on this plan, it is shown "Limit of workable coal" as we explained that this thinning of the seam takes place and has been a bar to further development in a northwesterly





direction.

Q. Did the Provincial Government ask that a test be made there?

A. Of what Mr. Scott.

Q. On the North side?

A. A test of what?

Q. A test of the height of the North side coal in Florence Colliery?

A. Not to my recollection. They may have asked the operators and you will have to ask the President of the Company for that information.

Q. How long since the Alexandria Mine closed down? That was under you, was it not?

A. It was closed down before my day, Mr. Scott.

BY THE CHAIRMAN - Where is the Alexandria Mr. Scott?

MR. SCOTT - In the Alder Point district.

BY COMMISSIONER MORRISON - Is that close to Point Aconi?

A. On the opposite side of the Gulf.

BY MR. McCOLL - We could find out that data for you, or the President of the Old Sydney collieries will answer that for you.

BY MR. SCOTT - We want to know the date of the closing of No. 4 Colliery.

BY MR. McCALL - We will get these dates for you. I can't carry them all in my head.

EXAMINED BY MR. FRAWLEY - On this whole question of sub-leasing policy there will be some further questions. But when you decide a seam is not good enough to work, that it is not profitable and you give it up, are you then in a position to lease that to someone else who may think it is profitable to operate?

A. Well when we develop a seam and find it not profitable, we have to examine and find out why. We have to find whether it is the quality of the coal, or the high cost of extraction, and we have to be governed by that. We still maintain our rights over that leasehold. We continue to pay to the Government the



annual rental of that and maintain our rights, with a view that at some future date when conditions change and perhaps new inventions take place, there may be a demand for that quality of coal, or there may be a development that comes in by which we can mine that coal at a profit, if it was that angle that stopped us.

Q. And you are not readily disposed to enter into subleases with other operating companies who might be willing to take a chance and go into a working that you did not think profitable?

A. No Sir, we are not willing to sublease them.

Q. That really is something that you have arrived at as a policy?

A. Yes. We wish to retain control of such areas as we have containing reserves, because although we show 190 years for these mines out at sea, yet if the demand for coal increases we have to open up somewhere else. We cannot increase from the submarine areas and we have to open up some of the inferior coal on the land areas and work them ourselves.

Q. But in your future prognostications it is not likely you will be reverting to land operations for a number of years?

A. Well the question was asked yesterday, what would be the prospect of output for the coming years. Were we going to be satisfied with what we sold in 1939, and Mr. McLaurin said he would sell all the coal he could. If he is successful and we can produce the coal at a price which will enable us to extend our markets, then we would open up these reserves which are all we have left to open up.

Q. You regard these abandoned mines as containing reserves?

A. Definitely.

BY THE CHAIRMAN - They are abandoned mines for the time being, but not abandoned leases?

A. That is right.

BY MR. FRAWLEY - There have been operators no doubt that have approached you for certain areas which you are holding in reserve, but your Company has not seen fit to sublease?

A. The Independents who are in operation, and have been for





some time, and have been given subleases from us, there have been none of them held up by not getting an extension of a sublease from us.

Q. But there have been independents that you didn't give leases?

A. Yes, and for good reason, but no independent has been refused extension of his lease. We may have refused to sublease another area altogether, but we have not stopped any independents in that manner.

EXAMINED BY MR. JENKINS

Q. Mr. McCall, you said the Dominion Coal was holding in reserve a certain amount of leased coal to operate when necessary. For instance say a market today calls for six million tons of coal, and something may occur in 5 or 10 years time where you would have to produce ten million tons to meet the market, then to produce the ten millions you would have to open up collieries on the reserve coal areas; that is what you would do?

A. Yes.

Q. I am trying to connect that with the statement that you could not get more than seven million from the collieries here.

A. We are talking about the developed collieries. When we get our complement of men back all these submarine mines will be running to capacity, and we cannot increase the output from these, and if the demand sprang up and we saw it was going to be a steady demand, we would have to open up Lingan, and then we would have to open up these other mines of lower grade coal.

Q. In other words, you could produce ten million tons a year by going into your reserves?

A. Three million tons is a pretty big jump.

Q. It is possible?

A. With the openings we have I very much doubt if we could possibly jump up three millions. You see our reserves of coal are extremely limited. We have practically untold reserves in advance of our present workings but we cannot get at them except through the present workings, so you are limited as to



the amount you can produce from these submarine areas. And if you want to increase the annual output, and have been working the full time you can, then you have to get into new mines; and the only ones are these lower grade seams.

Q. Say all you can produce are seven million tons with your present mines. I am taking into consideration your number of openings. But you could increase that by opening up new mines to tap your present reserves?

A. Yes, if we could definitely market that lower grade coal at a cost. It is all bound up in cost too, Mr. Jenkins.

Q. In the Lingan area there is coal of good quality?

A. Yes.

Q. I presume those are the Harbor and Phelan seams?

A. Yes.

Q. You could produce there by opening them up, produce how many additional tons per year?

A. You have a 3-1/4 mile sea limit there. You would be warranted to open up seams to produce 3500 tons a day out of it.

Q. That would give you how many tons a year?

A. That is a matter of calculation; about 750,000 perhaps.

Q. Does that just include operating in one seam?

A. No, I am recommending the two seams. You have your ventilation to that too.

Q. That would be about three-quarters of a million extra tons a year?

A. Yes.

Q. What are the plans of the Company to operate the Harbor seam there on that plan of 1B colliery and have the tunnel from 1B to 26, a possible 3 miles from the pit shaft, and you will go back from that tunnel towards 1B shaft in extracting the coal?

A. Yes.

Q. What are the plans of the Company to extract from 1B to 1A shaft in that direction, or are there any plans?

A. Oh yes. The tunnels reach No. 6 colliery from Lingan.





and the development of the Harbour seam will follow around on the contour lines.

EXAMINED BY MR. MORRISON

Q. In the Harbour seam?

A. Yes. That will be worked as far as we can go to the rise and until we are stopped up there by a cover below the sea bottom. We get up to a point about the 200 ft. cover line, and that stops you from going any further. Now the Harbour seam has been worked from No. 9 and we are planning to work the Harbour seam from No. 1B up to the barrier line that separates No. 1B workings from No. 2. We are going to superimpose the barrier of the Harbour seam above the Phelan seam, and we will leave a barrier to the southeast against old No. 9 workings. Is that answered, Mr. Jenkins.

BY MR. JENKINS - Yes.

MR. McCALL - And going in a northerly direction in No. 26 we will carry on to the barrier which separates No. 1B from the future Ligan development. The coal in the Harbour seam over No. 2 workings is going to be worked by No. 20 colliery. That will be inter colliery value between No. 3 and No. 2.

EXAMINED BY MR. JENKINS

Q. Would you give me some information. First, what seam was No. 3 colliery operated on?

A. The Phelan seam.

Q. Can you give me any information regarding the tunnel that was driven to No. 6 colliery across to the Harbour seam some years ago?

A. About 1926 it went through.

Q. Did it amount to anything, or is it going to be used in the future?

A. It was put up as a prospect to prove what the Eastern development of the Harbour seam was in that direction. It was not intended at that time to run any big tonnage of coal from the Harbour seam, but there was a question that was in people's mind in those days as to what quality there might be over there,





knowing that all the seams, that is the Phalen and the Harbour seams, definitely were deteriorating in quality as they progressed to the East, and it was felt that the Harbour seam might be unworkable, and they wanted to get a real good demonstration of what the Harbour seam was like for future planning, so they drove that tunnel up. It was impossible to bore it from the land end, it was submarine there. In our workings of No. 20 we are not very short from being to that split.

Q. What were the results of borings?

A. It shows that the Harbour seam is not so good there as further West, but still of a workable quality.

Q. Have the Company in mind any plans for using that coal at some future date?

A. No.

BY THE CHAIRMAN - That tunnel was driven?

A. From the Phalen to the Harbour.

Q. In the No. 6 area?

A. Yes.

BY MR. JENKINS - Then you say a new mine opening in the Lingan area could produce 3/4 million tons a year?

A. Yes.

Q. Above the seven million, at the present operating cost?

A. Should demand warrant it.

BY THE CHAIRMAN - And then they will require \$2.00 a ton from the Government to get that raised.

EXAMINED BY MR. WADE

Q. So far as I remember Mr. McLanders said that his sales in Central Canada given the necessary public assistance, were limited by the capacity of the mines to produce, and not by his ability to sell the coal. Do you think my memory is correct on that point?

A. I think you need to get Mr. McLanders to repeat that statement. As I remember it, it was not given in that sense at all.



BY MR. McLANDERS - You see Mr. Wade, in order to sell a given tonnage of coal in Ontario, many factors enter in; what will be our competitive position, cost of production, the laid down cost of the coal with which we must compete, and whether the Government of this country see fit to pay the difference between. All I can say now is that we will do everything in our power to find a market for the coal produced, but unfortunately for the last four or five years we have not had the coal to sell there. And I thought the sensible way to proceed was to get the coal and recapture our market, and then if conditions are favorable, let us seek to develop our market.

BY MR. WADE - Can I have the opportunity of questioning Mr. McCall on Monday again, because it is necessary for me to have the Minutes of yesterday's meeting before I can continue questioning Mr. McCall.

BY THE CHAIRMAN - Has Mr. McLanders given what you think is the same explanation today?

A. Not that I recall.

BY MR. MCCALL - I was going to say that for a great many years now the Dominion Coal Company has maintained an even capacity of production around the figure that Dr. Gray gave, that was rather better than four million, about four and a quarter million tons of coal per year. Now you may in one year experience a big demand for coal, and the Sales Department might say we can sell more coal. No doubt they could in that year. But you have to take this over a number of years and look at how the future is going to be, whether this sudden demand for coal is a flash in the pan, or whether it is going to be sustained. If, just because of a flash in the pan, you open up another colliery, and then you come to bad times, it makes it so much worse for the colliery district. These things have to be thought out and not done on the spur of the moment. There has to be a great deal of future planning in connection with it.





BY MR. WADE - One can hardly help but agree with you.

However, we are interested in getting a little more concrete information than that.

BY THE CHAIRMAN - You suggested that you didn't get the Minutes this morning. That was my fault. The night before the staff worked until 4 A.M., and last night I was at the room at 11:30 and I understood that you were all through with your cross-examination of Mr. McLanders and that therefore it was not really essential to have that evidence at today's meeting, and I told them they need not finish it. However, if you wish to have the evidence for your own purposes, we will give you the opportunity of cross-examination. Would it be Mr. McCall or Mr. McLanders?

BY MR. WADE - Mr. McCall, Mr. Chairman.

BY COMMISSIONER McLAURIN - I happened to have a casual conversation with Mr. McLanders and he was wondering if he could get away from here now, but he does not want to be in Montreal if some question arises as to his evidence being improperly given.

BY COMMISSIONER MORRISON - As I take it, you are merely trying to find out if Mr. McCall agrees with certain statements made by Mr. McLaurin?

MR. WADE - Yes, and if there is any disagreement, I want an explanation from Mr. McCall. I do not need Mr. McLanders.

EXAMINED BY MR. WILLIAM CAREY

Q. Mr. McCall, as Engineer of Old Sydney Collieries, what do you say the life of that colliery would be?

A. As far as one can see it has about 34 years of life still, I believe. Thirty-four years was our estimate.

Q. On the North side of that Colliery, the coal is very much broken up there? Is it the intention of the Company to do any exploration work there to find out just what is to the North between the main Deepin Florence and Little Bras d'Or Gulf?

A. In the past we have driven in for a very considerable distance there to see if there was any recovery of the seam in



that direction, but instead of finding the recovery, we found the reverse, and we abandoned those attempts.

Q. Here about two years ago the Chief Inspector of Mines was called in and I was down in the mine with him that day, I think it was 19 level north. He thought a test should be driven there to find out what was there. On that place on the high side we had about 4 ft. of coal, and on the low side possibly 16 ft. wide it was up and down. That was the opinion of the Chief Inspector of Mines at that time.

BY THE CHAIRMAN - I am afraid you cannot put his opinion on record.

BY MR. CAREY - However, to get a clear picture of what is to the North between Florence Deep and Little Bras d'Or. I think we should have some understanding of what would be there. I understand that the old G.M.A., possibly 90 or 100 years ago, did some work there.

BY COMMISSIONER MORRISON - What is the G.M.A.?

A. General Mining Association.

BY COMMISSIONER McLAURIN - Mr. McCall is standing here for you to ask him questions.

BY MR. CAREY - Well I wish to find out whether they intend to make any tests between the North side of Florence and Little Bras d'Or to find out how much coal is there, or whether there is any there.

A. I think you had better address that question when the time comes Mr. Carey, to the operators of the Old Sydney Colliery.

BY THE CHAIRMAN - You were giving, Mr. Carey, what you understood to be the opinion of the Inspector of Mines?

A. Yes.

BY THE CHAIRMAN - Did you get that Mr. McCall?

MR. McCALL - I heard him state that he thought the Chief Inspector thought there should be a test.

BY THE CHAIRMAN - I understand you want to know Mr. Carey if Mr. McCall agreed with the Chief Inspector of Mines?



BY MR. McCALL - Well that recommendation was not brought to my attention. I would need to look at it.

BY COMMISSIONER MORRISON - But from your experience as a Mining Engineer, you would agree in a general way with that suggestion?

A. Frankly speaking, I think at the present time it would be a waste of money. I think it could be bored from the land area.

BY MR. FRAWLEY - What would it mean?

A. It would mean driving roadways in there and taking out more stone than coal.

Q. What Mr. Carey suggests, that you would develop to the north?

A. No, drive a prospect place in to see what the behaviour of the seam was in that direction.

Q. And you don't agree even to the point of thinking it is a good thing to make the prospect?

A. It is a matter of dollars and cents, because there will be more rock taken out than coal.

BY COMMISSIONER MORRISON - Could it not be done with a diamond drill?

A. It is submarine at that point.

Q. Have you any workings underneath?

A. No.

Q. So the only way to do it would be to drive across it?

A. Yes.

BY MR. FRAWLEY - I am bothered about the business of the Chief Inspector of Mines making these observations.

BY THE CHAIRMAN - We have not his opinion before us, and we can't know what his opinion is.

BY COMMISSIONER MORRISON - Mr. McCall, this explanation that you gave to President Jenkins concerning the Harbour seam and the future policy of the Company, that has all been taken into account in these estimates that you gave us already this morning, has it not?

A. Oh yes.





BY MR. SCOTT - Did you say that the Company didn't abandon any leases, in your answer to Mr. Frawley?

A. Some leases. I did not say we had not relinquished any.

Q. Was the Jubilee shaft put in the right and proper place to tap the Jubilee seam?

A. Well I think they had pretty competent Engineers in those days, and it seemed to them to be the best place to put it.

Q. Have you any idea how much money that cost, to sink that Jubilee shaft and put that up-to-date equipment around that bank head?

BY THE CHAIRMAN - They were not operating that at that time. It was the Nova Scotia Coal, under a different management altogether.

BY MR. McCALL - I have never seen any definite figure on it Mr. Scott.

BY MR. SCOTT TO MR. McCALL

Q. Would it be two million?

A. I should not say so.

Q. Would it be one of the best equipped bank heads on the North side?

A. Perhaps on the North side, yes.

Q. What condition is it in today?

A. Pretty poor, Mr. Scott, pretty poor.

Q. Would you say that the Company abandoned it?

A. They are not operating it, or trying to maintain it.

Q. Would you say that the Company has abandoned the Jubilee seam when they had this mine set up?

A. Not necessarily.

Q. Would you say that the Steel Works in Sydney Mines was abandoned?

A. You are asking me something I know nothing about.

Q. Is the Steel Works there yet?

A. No, they were not operating when I came to this country.

Q. The Jubilee either?

A. Yes, the Jubilee was.



EXAMINED BY MR. LING

Q. Mr. McCall, in the opinion that we got from Mr. Gray the other day I think, if I remember correctly, talking about the coal seams that overlie the seams that are working now, that where it was possible to bore from above ground to tap those seams and get an idea of just what the seam contained, that that was done, and where it could not be done from the surface you had to wait until your seam of coal that underlaid that seam got down to a sufficient depth, and then you bored up and tapped the seam from that method and got an analysis of what that seam contained in that way. I think that is what Mr. Gray told us here the other day.

A. Yes.

Q. Was that in your opinion the proper method of handling that situation?

A. I think you can get a very good idea of what you are doing by that means. There have been cases that I know of where you have been led astray by it. You have to use your intelligence in such matters.

BU MR. LING - The reason I asked that was because, looking at the fact that you drove a tunnel from No. 6 to the Harbour seam, planning, from your own evidence, to find out what the Harbour seam contained. A tunnel is a very expensive operation, and if you could get that information from a bore hole sent up from No. 6 colliery, it would mean a cheaper overhead on No. 6, or a cheaper Capital Expenditure, whichever way you put what that tunnel would cost. That tunnel would have to go while the colliery was still in operation.

BY COMMISSIONER MORRISON - Surely you are not suggesting that that tunnel would be a Capital Expenditure?

MR. LING - Oh no, it was not. Over in New Waterford we had the same thing happen in No. 14 to the Barrabois; and the whole operation was abandoned after they struck the seam of coal.





BY MR. McCALL - Of course Mr. Ling, you can be led astray by boring holes, and you are safer if you really want to know what you are going to mine and you are going to open up a mine, the cost of the tunnel is just a bagatelle on the cost of that development, and it is a guarantee that you are going to know what you will get before you go in there.

BY THE CHAIRMAN - You will understand, Mr. McCall, that in the presentation of your next brief you are not under oath.

4:15 P.M. HEARING ADJOURNED







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